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BEGINNINGS IN PRE-VOCATIONAL EDUCATION, IN CALGARY, ALBERTA

Robert Massey, Principal, Victoria Pre-Vocational School, Calgary

IN June, 1913, the School Board of Calgary, Alberta, decided to relieve the writer from teaching duty during the Fall term, and instructed him to study the question of Pre-vocational Education with a view to making a start in actual work at the beginning of this year.

In pursuance of Calgary's usual policy of doing things, and doing them thoroly, a commission of three was sent to the chief cities of the Middle and Eastern States to gather information. This commission, on its return, handed in a valuable report, containing the result of their observations and inquiries in the different cities visited. A few extracts from their "Conclusions and Recommendations" are here given.

> "The experience of many cities has shown that the Introduction of strong pre-vocational courses in the seventh and eighth grades has helped to keep in school many who would otherwise drop out too early and drift into 'blind alley' occupations. Many children who drop out of school are classed as 'dull' or 'backward,' merely bcause they are 'Hand-minded,' that is, their brains re-act more to things and actual doing than to abstract studies. Such children in the atmosphere of a pre-vocational school, expand and develop tremendously, and, as has been shown in several places in our report, soon make equal progress in academic work with those of the studious type.
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> * * * * We were impressed with the great interest in the newer forms and methods of education evinced by the principals of the regular schools in the various American cities we visited. As noted earlier in this report, many principals have asked to have their schools changed so as to include pre-vocational courses, and where that has not been possible, have assisted in many ways to make the pre-vocational centers a success. * * * *
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> We recommend that immediate steps be taken to organize pre-vocational courses for boys and girls in some convenient center. The Fitchburg, Mass., scheme of (a) Industrial side, (b) Commercial side, and (c) Household Arts side, appears to us to be a suitable one for Calgary's needs. * * * *"

On the return of this commission to Calgary, A. Melville Scott, Superintendent of Calgary Schools, made an extended tour thru the States, and came back fully convinced of the value of pre-vocational education.

During the months of September and October, 1913, a canvass was made of the Calgary schools. Appended are some interesting statistics.

(The school population of Calgary may be taken as about 7,500.)

June, 1913.

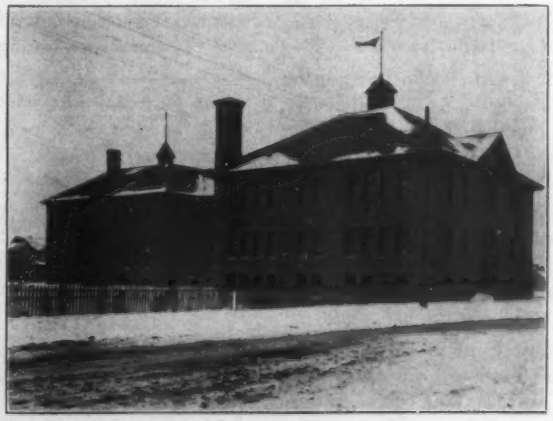
No. of pupils in Grade V	610
No. of pupils in Grade VI	332
No. of pupils in Grade VII	228
	1170

September, 1913.

No. of pupils in Grade VI	463
No. of pupils in Grade VII	334
No. of pupils in Grade VIII	204
	1001

Promotions were made at the end of June. It will be seen that 169 pupils dropped out—mainly those in the fifth grade who had reached the legal school leaving age of 14.

Again, of 396 pupils in Grades VI and VII, who were questioned, only 91 expressed their intention, thru their parents, to enter high school and university. Of 216 pupils in the eighth grade, who intended to take up occupations other than professions, only 36 intended to enter high school.



Victoria School, Calgary, where the First Canadian Pre-Vocational School is Housed.

Art and Drafting Room.

Print Shop.

This led to the all-important question: What is to be done for the pupils who are to engage in Industrial or Commercial pursuits, and of whom such a large number drop out before reaching the eighth grade? The study of this question led to the formulation of Calgary's Pre-vocational Problem, as follows:

1. To prolong the school life.
2. To assist those who intend to take up a trade.
3. To modify the school curriculum to suit those who do not intend to take the high-school course, and yet to keep the high-school course in view for those who, while taking the modified pre-vocational course, may, later on, change their minds.
4. To assist those who are beyond the average age of their grade.
5. To study industrial conditions in Calgary, and form a Vocational Bureau.

The writer, in accordance with the School Board's instructions, spent five weeks—in October and November, 1913—travelling and visiting Pre-vocational Schools in the principal cities of the States between Chicago and Boston. In his report to the Board on his return, he said:

"It would be invidious to select any particular schools from those visited, as outstanding examples of good pre-vocational work. All the schools I visited are earnestly engaged in solving the problem of better preparation for life and life's work. * * * *

"The old boast of a perfect system of education on Academic lines from the Kindergarten to the University, paid for by the taxpayers, and taken full advantage of by about two per cent of those taxpayers, is undergoing modification. The time is coming when the boast will be, of perfect systems of education, leading from the kindergarten to the Commercial School, the Mechanic Arts School, the Agricultural School, the Household Arts School and the professional Schools of the university. * * * "

The following letter was sent out in December last to the parents of pupils in the sixth and seventh grades, who had stated, in the first canvass, that their children were not proceeding to high school:

"The school board's interest in the welfare of your child is the reason for this letter to you concerning the Pre-vocational work to be started in the Victoria School in January, 1914.

"This Pre-vocational work aims at giving to those pupils who do not intend to proceed to the high school and the university, but are to engage in some Industrial or Commercial occupation, a better training than is afforded by the ordinary grade work. Half-time will be given to Industrial work and half to Bookwork. The Industrial and Bookwork will be so correlated that each will help the other. It has been proven, beyond the shadow of a doubt, that the bookwork is better done under this management than when it occupies the whole time. In fact, it is the experience wherever Pre-vocational work is taken up that boys and girls who take the Pre-vocational course, and afterwards decide on going to high school, make, in many cases, a better showing than those who enter from the ordinary grades.

"The Pre-vocational course will consist of literature, spelling, grammar, composition, arithmetic, history and civics, drawing, design, music, with woodwork and printing for boys, and dressmaking, millinery and household arts for girls.

"Pitman's Shorthand will be taught to those who desire to learn it.

"Generally speaking, children over 13 years old, and in sixth or seventh grade, are eligible. Other pupils will be considered individually on their merits.

"If you desire your child to enter the Pre-vocational School, kindly fill in the enclosed form, and return to me at your earliest convenience. It is, of course, understood that the child may return to ordinary grade work at any time, if so desired by you."

Applications came in from over 100. A new wing of Victoria Public School had been set apart for the Pre-vocational work. The school opened on the 5th of January with an enrollment of 87—41 boys and 46 girls—taken from the grades as follows:

Grade IV	5
Grade V	11
Grade VI	35
Grade VII	36
	87

Sewing Room.

Household Science Room.

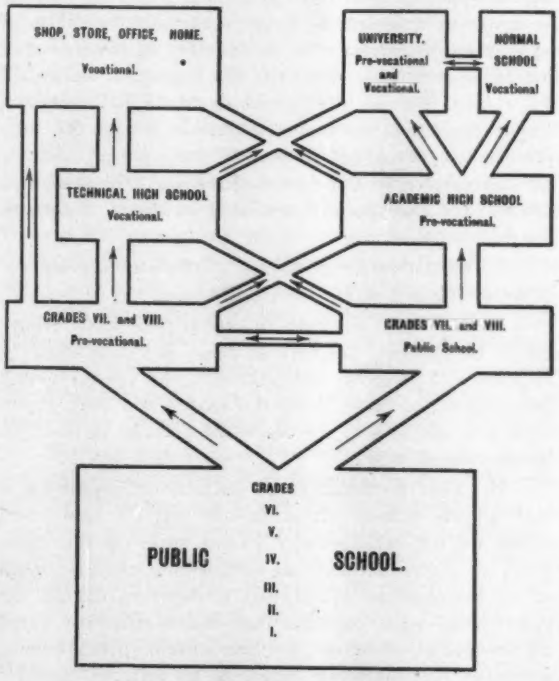
The following details of the school building and equipment may be interesting:

(a) Two grade rooms, fitted with standard desks, 42 or more in each.

(b) A room fitted and furnished as a sewing room.

(c) Household Science room fully equipped.

(d) A serving room, furnished.



Pathway of Student Thru Calgary Schools.

(e) A laundry, simply equipped.

(f) A room, fitted up for woodwork, cold metal work, and wood turning.

(g) A printing room, fully equipped for job-printing.

(h) A room in basement, equipped with wood-working machinery.

Besides the principal, seven teachers were assigned to the school; two grade teachers, a teacher of shopwork and drafting, one of printing, one of drawing and design, one teacher of household science and arts, and one drill instructor.

The accompanying graphic representation of the pupil's pathway thru the schools from the lowest grade to the shop, store, office, university, or normal school, indicates the writer's idea of the function of the Pre-vocational school, and its place in the general scheme of education.

The easier and more natural pathways from school to school, and from school to university or shop, are made wider in the drawing. The more difficult ways are made narrower. For example it is better for the boy who is to take shop or office work as his vocation that he pass from the sixth grade of the Public School, to the Pre-vocational School, thence to the Technical High School, and from it to the shop or office. But, if, owing to economic conditions the boy must go to work as soon as possible, the proper road is from the Pre-vocational School to the shop, store or office.

The city of Calgary is determined to have the complete scheme of education, as represented above, worked out. It has already the Public School, the Pre-vocational School, the Academic High School, the Normal School, and the shops, stores, offices and homes. The university classes are being held in temporary premises until the university building is erected, and the School Board has definitely committed itself to erect an up-to-date Vocational High School in the near future.

Calgary has the honor of being the first city in Canada to introduce the Pre-vocational School into the educational scheme. The scheme will be completed, and, in the near future, young people in Calgary will be offered educational facilities, second to none on the continent.

RE-ORGANIZATION OF MANUAL ARTS

Report to be Presented by the Manual Arts Committee to the N. E. A. Commission on the Re-organization of Secondary Education, at the St. Paul Convention, July 4-11, 1914

THE Committee on Manual Arts has been guided in its work by two major considerations.

First, while not forgetting the small percentage of pupils who now complete a high-school course of some kind, we recognize that this whole movement has for its *chief* object such reorganization of school methods and ideals that a majority of those children who now *do not reach* the high school, or who do not succeed measurably with the work they now find there, may have the great, uplifting influences of two or three years of a purposeful, dynamic, appropriate secondary education.

Second, we believe that the teachers of the manual and industrial arts are peculiarly qualified to take a prominent, active part in this effort to widen the field of secondary education. The work in which such teachers are engaged has its basis in the industries into which the large majority of the unschooled adolescents now go, at least in urban communities. These teachers, by their natural aptitudes, by their training, and by their personal relations with their pupils, are peculiarly qualified to appreciate the ambitions and the needs of the future industrial worker and, therefore, to take a leading part in his emancipation from the industrial slavery which modern economic conditions have brought about.

In our first report to the commission we stated that our committee had arrived at the following tentative conclusions:

1. The major purpose of instruction in the manual arts is to contribute directly to the vocational efficiency of the pupils.

2. There should be developed shorter courses with longer school days and longer school year and with specific vocational purposes. Short vocational courses should be made available for pupils of secondary school age, who can profit measurably by the instruction given, even when such pupils have not fulfilled all the requirements of graduation from the elementary school.

3. There must be an earlier opportunity for differentiation of purposes, courses and methods.

We also raised certain definite questions, five of which are as follows:

1. Is college preparation one of the legitimate aims of manual-arts instruction?

2. To what extent can general manual-arts courses be utilized as a basis for differentiated vocational courses?

3. By what terms can courses of study in the manual or industrial arts be adequately expressed?

4. What are the essential qualifications for teachers in vocational courses?

5. What special propositions are there relative to manual-arts courses in rural high schools?

The purpose of the present report is to put more concretely before the commission the available material relating to these five questions and to express the further conclusions of the committee regarding them.

College Preparation.

While college preparation is only one and perhaps the least of the functions of a public high school, still we are convinced that the individual high-school pupil who is consciously and successfully on his way toward college should have as much attention given to his needs as one who is preparing for some vocation which can be reached directly from the high school. We reflect that in the past almost exclusive attention was given to such a pupil, but that the tendency of modern educational thought is in the other direction. We stand unanimously for equal opportunity of all high-school pupils to receive the kind of instruction which is best for each.

We are quite clear that the characteristics which make for success in college work are easily determined and that the efficacy of manual arts instruction in the high school in the development of these characteristics may and should be measured. We believe that work for high-school pupils who are preparing for college should be given in a way that would contribute to habits of educational research and to the creation of an interest in industrial activities. For such pupils much stress should be laid on the consultation of scientific and technical literature pertaining to the materials and to the shop processes involved in the course.

To what extent can general manual arts courses be utilized as a basis for differentiated vocational courses in the high school?

By what terms can courses of study in the manual or industrial arts be adequately expressed?

If the ideals set forth in our second "conclusion" are to be realized, the first of these questions must be answered. It will be seen also that the answer to the first question depends upon the second and that, therefore, it is desirable to discuss *both* questions in their relation to each other.

By what terms may one satisfactorily describe a manual arts course? It is obvious that the traditional terms are not satisfactory. If one turns to the statement of courses of study as outlined in school catalogs or as discussed in educational conferences during the past twenty years, he finds that such courses are based on schemes of exercises involving certain specified tools, processes and materials resulting in certain "models" or "projects." The number and length of periods per week are also given. Occasionally reference is made to accompanying drawings and less frequently to other related subjects.

For the schools as they have been organized in the past, with little or no differentiation of purpose in the courses given, and no recognition of the various types of pupils enrolled or of the time which each was planning to devote to the remainder of his school life, perhaps the traditional methods of describing courses are

adequate. For the modernized school, which it is the purpose of this whole reorganization movement to develop or create, some more adequate method must be employed. Our committee has had this matter under advisement, and we submit the following propositions. The courses of study in the manual arts must state:

1. The paramount impelling purpose for which the course is given or taken.

2. Any minor or secondary purpose.

3. The proportion of the whole school time which is to be devoted to the course in question.

4. The proportion of this manual-arts time which is to be devoted to the different subdivisions of the work, as, for example, (a) manual work, (b) the technical instruction or the related drawing, (c) related literature, etc., etc.

The extent to which "general" courses may be made the basis for "vocational" work, will depend largely on the definiteness with which the preceding statements are made and the adequacy of the time-allotment for the purposes stated.

To make the "general" course "vocational" it will generally be necessary to devote much more time to the work, and to give it in much longer periods.

Each course must relate to some industry, as, for example, printing, forging, or concrete construction, and should draw its illustrative material from the industry and refer the pupils to the literature, both current and historical, of that industry.

All industrial subjects should be open to first-year pupils, (perhaps seventh and eight-grade pupils of sufficient maturity and ability), and should not be restricted to specific school years as is now commonly the case, as, for example, assigning woodworking to the first year, patternmaking to the second, forging and foundry to the third, and so on. Few of the manual-arts courses now given depend upon each other, each being essentially an elementary course. There is no good reason, therefore, why machine-shop instruction should not be available for first-year pupils, provided that the dominant purpose of the course requires this work for its fulfillment.

Furthermore it should be remembered that, in the modern school, courses of study cannot be stated in terms of subject matter alone, but that such terms must be employed as will reflect the purpose for which the course is given and the social, economic, physical and mental conditions of the pupils for whom the course is planned.

It cannot be stated too often or too emphatically that modern industrial conditions are radically different from those which existed when our traditional high-school curriculum was developed. The following quotation is one of many authoritative statements which might be given in corroboration of this fact. It is especially appropriate to our discussion of the manual arts.

"The factory system was not accidental; it was the inevitable result of the unceasing effort to reduce the cost of production. Production by machinery, like production on a large scale in general, came because it was economical, uprooting old institutions, extinguishing tenacious customs, widening the gulf between the masters and the servants, dislodging the old landed aristocracy, doing an infinite amount of damage in an infinite number of ways, but rendering possible in the end a vastly greater production and consumption of material wealth * * * Not without interruption from men and institutions, and not without guidance at times by combinations of men in legislature, church and trade union, but in its ultimate direction irresistible and irreversible, the car of industrial progress has travelled its appointed way, improving, enlarging, but always complicating the mechanism of industry, and so ceaselessly reducing the proportion of independent workers. Capitalism, the separation of the industrial classes, and the labor problem are the products of progress itself."

In planning to utilize general manual-arts courses as a basis for vocational courses another set of facts must be taken into consideration, namely those relating to high-school attendance. These facts are so well known, however, that they demand no extended discussion here. But we must not ignore the fact that the vast majority of public-school pupils entering high school do not complete the traditional high-school course but enter immediately upon vocational life from one or another of the earlier high-school years.

When manual-arts courses are stated with full recognition of such facts as these and when they are varied in purpose, length and distribution of time, and when such methods are employed as will make the realization of the dominant purpose reasonably sure, there can exist no reason whatsoever why "general manual-arts courses" may not "be utilized as a basis for differentiated vocational courses."

It is easily possible that two pupils may be engaged in doing similar technical work but with radically different motives, and that this same technical work may contribute equally to the accomplishment of these two distinct purposes. Our committee is unanimous in its support of this proposition. We believe that the question never would have been raised had not the demand for a separation of the cultural and vocational courses been so persistently brought into the discussion. We are committed to the proposition that *complete* separation between vocational and general education is impossible, unnecessary and undesirable. While recognizing the fact that, for purposes of theoretical analysis, such separation is imperative and is conducive to clear thinking and definiteness of aim, we maintain that *in practice* the two are rarely to be so clearly distinguished and that the combination of these two elements is both natural and inevitable, the difference in *result* being often merely a matter of emphasis. We, therefore, deplore the recent attempts to shape future practices in the manual arts by so-called "definitions" which in reality do not define existing procedure but which seek to shape future practices to some pre-conceived opinions as to what these practices should be.

When a state enacts laws providing for financial aid to "vocational" education, it becomes the duty of those who administer that law to determine what constitutes vocational education; in other words, to make definitions for their own guidance and for the information of those

wishing to receive the state aid, but the efforts of such officials, (it should be noted that they do not always agree), the efforts of such officials should not affect our *judgment* in evaluating work which is actually in progress whether it be called manual training or industrial education. Our Committee affirms, that, when judged by actual practices and not by "definitions," much of our manual-arts instruction has contributed, and is still contributing in no small degree, to the *vocational efficiency* of innumerable boys and girls. We further affirm that no technically trained or practically trained man can point out the difference between practices, methods or content of the supposedly different courses. For example, we have information regarding a so-called industrial school, organized under a separate board, where boys of about 15 years of age are given hand work which consists of two hours a week of manual training without any industrial content whatever, while within two blocks there is a "regular" high school where a number of boys of about the same age are working on a commercial product, which is really used, and devoting thereto six or eight hours a week. Can there be any doubt as to which has "vocational" value? Yet the State subsidizes the first and will not aid the second.

It is our purpose to submit, for discussion at the St. Paul meeting, charts showing how courses of study may be stated and also how they may be used as "general manual arts" courses and also as a basis for "vocational courses."

Teachers' Qualifications.

Another question to which the committee addressed itself was that related to essential qualifications of the teachers of industrial subjects.

Here again our committee finds itself at some variance with those who are seeking to crystallize opinion too quickly and to "standardize" our industrial instructors, when in point of fact we have too few concrete examples on which to base any generalizations. It is obvious that both knowledge of the subject taught and knowledge of the processes by which the pupils acquire information and develop skill are altogether desirable, and are in fact absolutely essential in some degree. We cannot agree that such knowledge comes to an individual only thru so many years of shop experience, so many years of work as a foreman, and so many months' training in a normal school or teachers' college. Of the few successful men at work in the field today, it would be difficult to find two whose training had been gained in the same way. What methods for securing and developing the desired number of industrial instructors of the right qualifications will ultimately prove best will only be determined by years of practical experience. Meanwhile such teachers will be in great demand, and the demand will necessarily create a supply. Shops, colleges and normal schools are already being utilized by prospective teachers as training places where the desired characteristics may be acquired. We believe that all these efforts are praiseworthy, but we regret the attempt to stamp any of them prematurely with final approval.

Manual Arts in Rural Schools.

Another topic which seemed especially fruitful was the nature of the manual arts which should be promoted in rural high schools.

It is true that in the past pupils of rural high schools are found in every vocation and that, therefore, these schools should endeavor to present the same opportunities to their pupils as the town or city high schools. We believe this fact is so generally accepted that it does not need to be debated.

On the other hand the rural high school is coming to realize as never before, that it has a duty to its community which it has been rather slow to recognize, namely, the development of a better and richer rural life. The school is, therefore, endeavoring to adapt its work very specifically to farm activities. The work in the manual arts is no exception to the general rule, and it is more and more common to find in the rural high school such shop work as relates to the construction and repairing of farm buildings, tools and implements.

In iron work some simple forge work should be given the farm boy so that he may be able to mend a plow clevis without going to the nearby blacksmith to have it done. The country high school should make him familiar with the gasoline engine and dynamo so that electric light would be possible for the household. He should be taught how to mix cement and the principles of silo construction, cement foundations and bridges, etc., etc.,

In drawing for the boy in this high school, there is a great field in problems of landscape art to beautify the farmstead, planting plans, etc., etc. Problems also in drainage, plans for erection of buildings and remodeling buildings. Some of this may well be correlated with the girls' work in Household Art.

The future of the rural high school is ahead of it. And just now the most important qualification for the teacher in vocational courses in this rural high school is to have an abiding sympathy for the industrial life of the open country and a vision of the service to be rendered humanity in training 7,523,132 country boys and girls, of whom not one in a thousand will ever enter a high school, even a city high school.

NOTE—This tentative report has been approved by a majority of the members of the Committee on Manual Arts, and will be presented at the St. Paul meeting of the N. E. A. It is published at this time in order that it may be given careful consideration previous to its presentation. There will probably be considerable discussion on some of the points.

The personnel of the Committee is as follows: Frank M. Leavitt, of the University of Chicago, Chairman; Wilson H. Henderson, Hammond, Ind., Secretary; L. R. Abbott, Director Manual Training, Grand Rapids, Mich.; W. J. Bogan, Principal Lane Technical High School, Chicago; G. F. Buxton, Stout Institute, Menomonee, Wis.; Paul W. Covert, Manual Training High School, Indianapolis; A. D. Dean, Chief Division of Vocational Schools, Albany, N. Y.; C. H. Howe, Bushwick High School, Brooklyn, N. Y.; Ben W. Johnson,

Director Industrial Education, Seattle, Wash.; O. J. Kern, University of California, Berkeley, Cal.; C. W. Kirschner, Principal Boardman Manual Training High School, New Haven, Conn.; C. A. Maupin, Principal Industrial High School, Columbus, Ga.; E. E. McCready, Director Manual Training, Newark, N. J.; R. W. Selvidge, Peabody College, Nashville, Tenn.; F. W. Turner, Mechanic Arts High School, Boston; A. P. Fletcher, Ass't Superintendent of Schools, Rochester, N. Y.

Dollars and Cents as a Motive in Manual Training

Edwin L. Taylor, Plattsburgh, N. Y., State Normal School

I HAVE been asked to tell you something about the "order work" that our boys are encouraged to do in connection with their Manual Training. To begin with, the practice sprang up in a quite spontaneous manner. Contrary to the pedagogical notion that all school practices must be born of theory this thing, like Topsy, "jest nachully growed." Sufficient time has, however, elapsed to prove that the idea is born well endowed with vitality, and that when put into practice, if wisely directed, it is capable of valuable results. So we have reversed the order of pedagogic reasoning and out of the actual practice have evolved a pretty little theory. But before we can demonstrate the theory it will be necessary to understand something of the conditions under which the practice prevails.

Our Model School is composed of the eight grades and a four-year high school.

In the fifth grade we begin our manual training. Prior to this grade, we call it elementary handwork and both boys and girls are given the same problems. But with the fifth year the boys begin their woodwork and the girls their sewing. It is the fortunes of these boys that we desire to follow.

Our grades are limited to 25 pupils each. About half are boys, so in the four upper grades we have, all told, about fifty boys. In the high school, due to the fact that those who enter must declare it their intention to become teachers, the boys become conspicuous by their absence and out of an enrollment of a hundred pupils they number about twenty making the total number of boys in the Model School working at manual training about seventy.

We are limited in the matter of time to an even greater extent than in the matter of numbers. There apparently are so many things that are more important than the "art of doing something" that in the fifth and sixth grades our boys have for manual training but two three-quarter hour periods weekly. In the seventh and eighth grades there is an increase of one period per week. In the grades the work is required; in the high school the boys may elect four periods weekly thruout the four years. Possessed of these facts you may now see that limited time is the reason why we make a practice of doing work after school, on Saturdays and during vacations. But bear in mind that this work out of hours is not required, consequently only those boys profit by it who are so much interested that they not only use the opportunity, but, by their interest make work out-of-hours for their accommodation a pleasure to the instructor. Thus really they began the thing themselves by thus creating their own opportunity. These are the boys who develop along in the seventh and eighth grades into sufficiently good artisans not only to do, but to attract "order work." In the high school some of these boys become more expert than many a mechanic following the trade.

As to the nature of the work: from the very start in the fifth grade there is no "cut and dried" outline to be followed. The boys are encouraged to attempt the most ambitious projects that in the judgment of the instructor they can successfully handle. Toys and models that in reality are but tool exercises poorly disguised are avoided. Something useful needed at home by the pupil or by his friends, or something needed by the school is the ideal,—the real things of real life. And the workmanship is to stand, not the apologetic test of school standards, but the searching test of actual serviceability in actual use.

Perhaps this is the place to say that after the woodworking plant and plans were safely launched a printing-shop equipment was added. Here again the same ideals prevailed. Perhaps the kinship with the "real thing" is even more apparent there than in the woodshop activities. The novice can more quickly accomplish practical results and often times the newest "boys" in the shop are surprised by their own work into saying "That is just as good a job as they can do down town." In the language of a journalist and practical printer who visited the school it is a "real print shop."

This is the policy, inaugurated from the first beginnings of our manual training, "we expect the manual training department will 'pay its way' just as any self-respecting business enterprise should do." That is to say, instead of presenting the pupil with lumber, hardware, etc., and limiting him to a little basswood, a few nails and some shellac, he is required to pay for all his materials and is encouraged to use those best suited for the work in hand. The state finances the scheme and a supply of needful materials is kept in stock. From this supply the school provides the pupil his materials at cost, the revenues thus derived being returned to the state. The pupil pays, also, a small shop fee which is calculated to cover the cost of electric power and other general overhead expenses.

This system makes the pupil the rightful and self-respecting owner of his finished product. Under such conditions it would be a very stupid and unambitious boy who would not soon discover that he could sell such a thing as a well made table or chair. Or, happy

thought, if his parents disapproved of parting with his first achievement he could make another like it for Cousin George who had always wanted just such furniture for his den and who never knew before that "the boys did such work at school." This is the way that it began and it begins all over again practically every time that an energetic boy arrives at that point where his ideals and experience combine to make of him a real artisan. And to some of these junior artisans this earning capacity comes in time to be a vital matter and it is to these that the preference is given when it comes to arranging for work out of hours.

Somehow it did not take the community long to become acquainted with the fact that they could get things done at the Normal School. I suspected our regular semi-annual exhibits helped the matter along and the head of the manual training department soon began to feel as tho he were the manager of some thriving industry, so frequently was he asked, "can you build it at the 'Normal?'" and, "How much will it cost?" "Really you know there is no other place in town where we can get such things done."

Now the probabilities are good that the same general conditions prevail with most schools that prevail with us. Woodworking establishments, furniture shops and printeries may be plentiful in the community yet still there is a thriving trade waiting to "go to school" just the moment the school "gets wise" enough to see that such work is the most logical basis for genuinely educational manual training yet discovered. As I think of the nature of our "order work" I am aware that very little of it would be done did *we* not do it, so it is plain that we have no quarrel with trade unions and others who are ready to accuse us of using school equipment and cheap labor to injure their business. Very likely a little thoughtful encouragement can develop even a better "order business" than ours in any average town, but such a development means "bringing real life to school." A "real" manual training will be necessary to measure up to the standards that such commercial work will set up.

Now as to some of the details of our activities: Remember that no work is solicited and nothing is made up and put in stock to be sold later. All the work done on a commercial basis consists of orders that come thru the pupils or to the instructor. He figures with the boys on the jobs they undertake and determines what the price shall be. Usually the work is done "by the job" but occasionally by the hour, but only those boys who have become unusually proficient ever work by the hour. When a job is completed a bill is rendered for it in the name of the pupil who did the work. This bill is marked "approved" by the instructor and he generally receives the returns from which he takes the cost of materials, of which a careful account has been kept, and pays the balance over to the pupil.

So far as the "life history" of one of our orders is concerned it is purely and simply a problem in practical

A SEVENTH GRADE BOY AND FURNITURE HE BUILT.
The table and chairs went into a private home and the boy received $60 for them.

FURNITURE MADE BY BOYS FOR MR. TAYLOR'S HOME.

design. The purpose to be served, the maximum cost consented to by the customer, the materials selected, and the scope of our equipment are the elements of the problem. These are the elements involved in the commercial output of any manufacturing enterprise,—the elements involved in all the manufactured commodities of life. These elements must underlie all truly practical design and I submit that it is impossible to project them into school problems for adolescent pupils without the equally basic social principle of exchange. In these notations I do not mean to convey the impression that all the work done by the older boys is "order work." Such work is really only a small percentage but its presence has a most salutary influence upon the character of the projects undertaken and the workmanship of those who are doing work for themselves or to go into their own homes.

To catalog the "order work" that the boys have done would be a long story. Some of this work has seen several years of service and some of its builders are no longer in the school. They are going thru the "sieve" by which our democracy trys out the manhood of tomorrow. You probably would like to know if they are not all "making carpenters." To be honest with you there is not one, but so far as I know of them they are all "making good." They are "accomplishing results because they have a background of previous accomplishments and results."

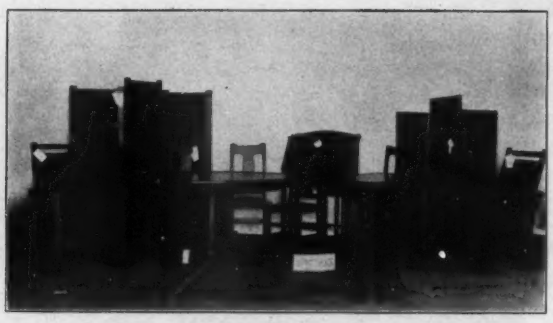
Our "order business" was not fostered for the sake of the community but for the sake of the boy; and not for the few dimes he may get at the time but for the real business and industrial fiber that it builds into his citizenship. But the "work" has a proud place in many a home and in some more public places as well. There are a pair of big play tables at the Children's Home that stand the racket of romping urchins. The Hospital has a set of three arm chairs, a settle, a flat-top desk, an umbrella rack and a screen. After nearly four years of constant use we are told "they are as good as new." The boys are now building a mission clock, another screen, and a heavy stool for the same institution. There is another set of five pieces in the "parsonage" hall, some in a law office, and some in one of the grade schools.

Perhaps I might be pardoned a personal allusion. The boys have practically furnished our home. Our living room, dining room, den, hall, porch and one bedroom are entirely in "school" furniture for which I have paid the boys in the course of about seven years upwards of $350.00. Would I exchange this for what you can buy at the store. Well, no! These that I have are personal friends while the others would be merely household furniture. The school-built pieces played a part in the inception of careers that are even now developing into purposefulness. They will be prized heirlooms in future years when the store article will have become forgotten rubbish.

The Normal School itself has not been like the "cobbler's wife" who proverbially goes unshod. Besides the work that the manual training department is continually doing for the school without remuneration there are several rooms in the basement, sundry cupboards, desks for the commercial department and various other jobs that the boys have built in vacation time for which they were paid just as any other mechanic would have been.

In our printing activities less encouragement has

A Combination Book Case and Desk made by one of the Boys.



Furniture made by Seventh Grade Boys. Part of an Exhibit which Won Prizes of $250 at a County Fair.

been given to local "orders" than with the woodworking for we felt, due to the more limited nature of this field, that any extensive activity on our part might justly be resented by the local industry. Enough, however, has insisted on coming our way to demonstrate our capacity for doing "real printing." All the printing needed by the school office is done by the boys during their regular class periods. For this work they receive no remuneration. Acting, however, on a suggestion growing out of this work we are now cultivating the other normal schools of the State with a fair prospect that for our mutual good they will co-operate with us in our endeavor to inject "real life" conditions into our manual training.

Now in conclusion let us reason together very briefly: You and I as manual training teachers have the adolescent boy on our hands. Nine-tenths of the whole school problem consists of that boy. Our job is to teach him to work; the virus of industry must get into his system now or never. "Conditions" taught his father to work but "conditions," for reasons too numerous to mention here, have become "null and void," and we are supposed to take their place. Some say that the boy must be given a vocation but he will never acquire a vocation until he knows how to work and wants to work. When he gets these two essentials, or rather when they get him, then there will be nothing in the sky above or in the earth beneath that can prevent his getting away with any vocation he may desire before anybody can be quick enough to stop him.

But in the face of these truths, the sober fact remains that most boys, who do not work, cannot work because there is no work for them to do—neither at home nor elsewhere. So for my part I undertook to solve the problem by giving them a job at the schoolhouse at such times as their "association with books" would permit. Now I did not give them something that resembled work, something to prepare them for work, something that made a noise like work, but something that *was* work for it was done for the same purpose that is a fundamental consideration of any sane person in the doing of work, namely, dollars and cents.

The Proctor System Applied to Domestic Science

Grace Viall Gray, Formerly Head of Domestic Science Department, Ames, Ia.

THERE is, perhaps, no greater test of a domestic science teacher's teaching ability than in the manner in which she handles the passing of food supplies and the returning of the same to the general supply table. If she has no hard and fast system governing these supplies, confusion and disorder reign instead of orderly quiet.

In many laboratories in both secondary schools and colleges, each child or student goes to the supply table for a teaspoon of butter, a tablespoon of flour and one-quarter cup of milk. As a result there are often five to ten girls pushing and elbowing and talking around this table which becomes very "messy" and untidy in about two minutes as the result of the general scramble to get things first.

A system such as the one given here insures quiet and orderly work and is guaranteed to be successful from the standpoint of both teacher and students. Wherever it has been installed it has always continued because of its great merit. After a teacher becomes accustomed to a "Proctor system" she would be lost without one.

A few teachers prefer the word "housekeeper" to "Proctor," but I have personally found that students, both little and big seem to prefer the latter word, possibly because they think it a little more dignified. Those of you who are discerning will quickly see that we have

merely taken the word used at the famous Oxford, in regard to the student government system and applied it very practically to the routine of the cooking laboratory.

The duties of the Proctors are as follows:

1. *Food Proctor.*

1. Watch supply table and keep it tidy. If milk or other material is spilled wipe it up immediately.

2. Pass food material to desk.

3. Put all food back on the supply table and in refrigerator if necessary: Butter, milk, etc.

2. *Laboratory Proctor.*

On entering room.

1. Distribute desk cloths, towels and dish cloths.

2. Be responsible for general appearance of laboratory.

Before leaving the room.

3. Sweep the floor.

4. Place chairs in order. See that each student places chair before leaving.

5. Put cupboards in order.

6. Arrange note books in neat pile.

3. *Sink Proctor.*

1. Clean sinks and basin before leaving room and see that they are kept clean during the lesson.

2. See that dishes are not piled in sink during the lesson.

3. Pass pitchers of cold water.

4. Empty pitchers and wipe. Put back in place.

4. *Stove Proctors.*

On entering room.

1. Fill tea-kettles.

2. Keep stoves clean and tidy (burnt matches, etc.).

3. Light ovens if needed.

4. Be responsible for food in ovens.

Before leaving laboratories.

1. Clean stove.

2. See that all gas in laboratory is turned off.

3. Leave teakettles empty with lids loose.

5. *Desk Proctors.*

1. O. K. every desk before student is excused from class.

2. Report missing utensils to instructor.

6. *Pantry Proctors.*

See that every pantry is in perfect order before leaving. Clean refrigerator.

A teacher who has no food proctor has to be constantly watching the supply table to see that no food is spilled or the table disordered. Under the Proctor system a teacher's mind and eyes are absolutely free to attend to the actual work in the laboratory.

At the beginning of the lesson the food proctor goes to the supply table, takes whatever supplies are needed and starts them down the line of waiting students. Each student measures off the required butter, flour, etc., and passes the material to her neighbor. Each student stays at her own desk and this is a wonderful advantage in a cooking laboratory. A teacher should aim to save as many steps as possible and do everything possible to preserve order.

When the girl at the end of the line has finished her measuring she may return the food to the table or the proctor may do so. Some teachers prefer the first way, others prefer the second. Where the class is large and there are two rows of students, much time will be saved if there are two plates of butter, two pitchers of milk, etc., one for each side of the room. Forbid students from going to the supply table except the Food Proctor or the girl returning supplies. There is absolutely no need for constant running between desk and table if the girls are attentive and take their allowances of all the supplies as they are passed.

It's a great joy to every teacher to enter her laboratory and find plenty of towels neatly placed, the fires lighted and the teakettles filled. A laboratory and stove proctor relieve the teacher of this.

There is no reason why a teacher should spend her valuable strength in putting the room in order after the girls leave, in cleaning sinks and stoves and in putting pantries and cupboards in order. The students should be taught to do this.

Whenever cold water is needed for the lesson, the sink proctor for the day fills the pitchers and passes them, relieving the food proctor of this. When double boilers are to be used pass the water in pitchers thus preventing every girl from running to the sink to fill her individual dish.

I have noticed in many laboratories on "baking days" a whole group of girls gathered around the oven "watching the oven door." Very soon one girl wants to see how her cake is progressing so she opens the door, just a minute, it is true, and shuts the door. May, Louise and Katie likewise are consumed with natural curiosity to view their products and the oven door is opened again for another minute or two. Many failures are caused in laboratories by too much opening and shutting of doors.

There should be a rigid rule regarding the oven doors. No one but "teacher" and the stove Proctor should be allowed a peek at the mysterious oven. When the pans are ready for the oven, the stove proctor collects them on a stray and puts them in the oven; watches the baking under the teacher's supervision and when the products are pronounced "done," she returns the pans to their owners. Under this rigid ruling a girl never leaves her place during the baking.

Many girls are careless about turning the gas completely off at their individual stoves. Before the stove Proctor leaves the room she must test each individual gas-stove and see that it is perfectly tight.

A great many teachers spend much time after each lesson looking over the desks to see that every utensil is there and in its right place. This has to be done but why not train the students to do it?

Some skeptical person may be saying, "What is there left for the instructor to do? She seems to be shifting the responsibility of all the work to the students' shoulders." There is plenty and more than enough for her to do. She has the responsibility of getting the right

amount of supplies there on time; she often has to change her plans because something promised failed to come at the last minute; she has to be on her feet almost constantly. She has to go from desk to desk; from table to stove; from stove to table and so on all day long. I have yet to find any profession that is more nerve-tiring and trying than the teaching of Home Economics. A teacher is a much better teacher if she can get co-operation from her students than if she does everything herself. The girl who gets in the classroom a little earlier today because she is laboratory proctor and distributes the towels and dish cloths is learning what responsibility is, and that is one of the things for which we are aiming in our Home Economics.

After a few weeks of Proctor system, a teacher will be able to leave the laboratory if she wishes, at the close of the lesson to show some guest thru the building; or look over the supplies and make out her list for the next day or mark note-books.

After the proctors are thru with their work and gone she can make a survey of the work and grade each proctor according to the work done. The schedule below shows how simple it is to arrange this system. If there are only the small number of five in the class still each girl has the opportunity of doing a different piece of work each week. After each name is left a margin for grading. The system here used is the A. B. C. system. A. 90-100, B. 80-90, C. 75-80.

The girls are marked on their Proctor work the same as on any other work. At the end of the month the Proctor grades are averaged in with the laboratory and note-book work. The girls are very careful to perform their Proctor duties carefully if they are marked upon them. If a girl is to be absent she must ask some one to do her work for her.

attractive things in the laboratory. Students would gather around it to see if they were scheduled for duties and to see their grades. The list can be made for the entire term, thus saving much time. If the class is large the students will not have to serve every week.

A typewritten list of rules such as follow will be found most helpful, put where everyone can see it:

GENERAL RULES FOR ORDER OF LABORATORY.

Tea Kettles should be left empty and lids loose.

Stove should be as clean as knife and paper can make it. Be sure to leave it dry, that it may not rust.

Do not set anything on the stove when not in use.

Leave the desk top and bread board clean and dry.

After using brushes, wash and leave in desk, brush side down.

Leave all tools clean, especially the steels bright and dry. Knives are liable to rust.

Do not soak steel knives and forks nor wet the gearing of Dover eggbeaters.

Turn knife edges to the left.

All desks must be closed before student leaves laboratory.

See that desks are left clean, and everything in place.

Wipe the sifter with a dry towel. If it needs washing, thoroly dry it before replacing in desk.

Be sure that all utensils are dry.

See that the tile or top of the desk is clean.

Hang folded towels and dish cloths on rack to dry.

Do not put paper or broken articles in waste jars.

When putting desk in order if an article is imperfect or cannot be cleansed, return to the instructor and get duplicate with which to complete the equipment.

See that the thermometers are returned to the table. Do not leave them in the ovens or on the desks.

MONTH OF SEPTEMBER.

Dates	Sept. 1.	Sept. 8.	Sept. 15.	Sept. 22.	Sept. 29.
Food Proctor	Shaw	A. Gaston	B. Campbell	C. Smith	Gray
Laboratory Proctor	Smith	C. Gray	A. Shaw	B. Gaston	Campbell
Sink Proctor	Campbell	A. Smith	C. Gray	B. Shaw	Gaston
Stove Proctor	Gray	B. Shaw	O. Gaston	A. Campbell	Smith
Pantry Proctor	Gaston	A. Campbell	B. Smith	O. Gray	Shaw

Remarks.

Sept. 15. Campbell neglected to put food in refrigerator.
Sept. 1. Smith left laboratory before everything was in order.
Sept. 8. Smith did not clean sink.
Sept. 8. Shaw did not empty tea kettle before leaving; left untidy stove.

In the column for remarks, indicate why a girl received a low mark, thus preventing the girl from coming to you to ask the question why she received such a low grade and also to show other students that such failings are recorded against them. Typewritten copies of the proctor lists and the Duties of Proctors should be tacked in the room where all can see them.

I always found that my Proctor lists were the most

Extinguish the ovens when thru using them.

Get floor cloth if it is needed.

A Domestic Art teacher tells me she has installed proctors in her sewing room. A machine proctor puts the machines away at the end of the lesson seeing that each one is in order while a laboratory proctor arranges the laboratory for the next class and leaves the room neat and tidy for the new-comers.

An Elementary Problem in Portland Cement

Leon Loyal Winslow, School of Education, University of Pittsburgh

WHEN properly conceived as a school study industrial arts possesses a subject matter peculiar to itself, cultural as far as general education is concerned, and practical, when viewed from the industrial side. In the elementary school this work functions directly to adjust the child to his environment by instructing him in things as well as in ideas that he may grow not only in ability to reason and to remember but in muscular power and in neuro-muscular control.

As a school subject industrial arts is not bound in by a narrow horizon. Whosoever would teach it well has at his command a great mass of subject matter limited in content, only by all the natural materials, and in manipulative possibilities, only by the transformation of these materials industrially into things of use and beauty. It would seem that we have not utilized in the past a very vast number of the industrial possibilities available.

One phase of industrial activity to which some attention might profitably be given in the elementary school is that of cement and concrete. Especially is this true as regards the American public school, for in the United States more Portland cement is produced annually than is made in both England and Germany combined, countries which rank next to us in its production. Evidences of the universal use of cement are seen upon every side. It is indeed a very dull boy or girl who is not curious regarding this material. He would know more about it, what it is; where it comes from; how it is made; why it is used so extensively; why sidewalks are made of it. He would like to mix and try to make something out of it for himself, and he should be given an opportunity for such expression.

An appreciation of Portland cement and a study of the way in which it satisfies human needs for constructive purposes may be attempted even in the lower grades. It is not necessary to build a house or to construct a bridge to treat the work effectively here. We have a way in most educational matters of turning away some of our most distinguished friends just because we can not entertain them sumptuously. Instruction in Portland cement can be given and given well with very little equipment and expense.

A class of students in the School of Education, at the University of Pittsburgh, has just worked out a problem in cement which appears to offer many valuable suggestions as to how this material may be made use of advantageously in the grammar grades. The problem is a tile, suitable for such tile constructions as bathroom walls, fireplaces, etc. Considered individually, one of these tiles, Figure 1, can be used on the dining table as a stand for the teapot. It is produced by twice pouring the cement, two colors or one color and white being used. The lighter color appears as an inlay. The project is one which demands intellectual study as well as manipulation if it is to be regarded as of maximum educative value. It should offer opportunity for individuality and should include the aesthetic side by providing for artistic expression.

The composition, preparation, and uses of cement are investigated by a class undertaking such a problem. The history of cement might well be looked into as well as its geography. Its cost would furnish opportunity for arithmetical calculation worth while and the amount of material needed for the work would offer other problems.

In manipulating materials many facts will be learned. The mixing of cement with water, the mixing of dry cement with dry color and of this mixture with water, the placing in the form, the setting and seasoning will all be understood in turn as the work progresses.* Eight steps in the making of the tile are shown in Figure 2. The method as here shown will be described in detail.

The design is first drawn in pencil on a piece of squared paper, in this case 5″x5″ as shown in A, Figure 2. The principles of design which should be emphasized are those involving structure, distribution of light and dark, and fitness to purpose. If there is time for it, these designs may be inked to better show the contrast of light and dark.

The form, Figure 2, B, is a shallow square box, five pieces of ⅞″ stock, soft wood, being required in the making of it. White pine is recommended for all small work of this kind. One piece ⅞″x5″x5″ is needed for the bottom of the form; two pieces ⅞″x2″x5″, for two sides; and two ⅞″x2″x6¾″ for the other two sides. As soon as the pieces are cut to size and squared, they are

*If the problem is to be introduced into a grade which has not used the ordinary woodworking tools, the forms may be made by an advanced grade for the lower one, or they may be made by the school carpenter. Of course it is best wherever possible to have the forms made by those who will later use them.

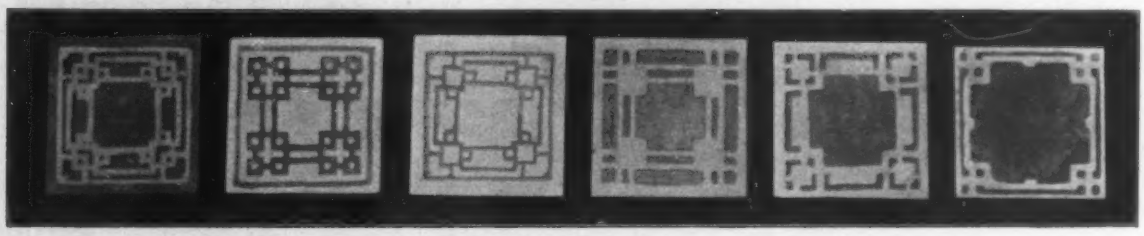


Fig. 1. Cement Tiles.

oiled with linseed oil that they may the better withstand the moisture. The form may be assembled with nails or with nails and screws. All nails are driven to within about 1/8″ of their heads that they may be drawn out easily after the cement has set. When both screws and nails are used, the screws will be placed in the side grain of the wood, the nails in the end grain.

With this box-like form a flat tile 5″x5″x1⅛″ could be cast. But as a decorated tile is desired, provision must be made in the form for the decoration. This might be worked out by carving the bottom of the wooden form. But this process would not only be too difficult, but would require a great deal of time. The problem of a modification of the form for decoration can be solved by introducing a layer of clay in the bottom of the form as clay can be easily carved or molded when moist. The clay is prepared in a sheet ⅜″ in thickness, thus reducing the thickness of the tile which it is possible to pour in the form from 1⅛″ to ¾″. This work may be accomplished easily and quickly by using a rolling pin. Two ⅜″ strips about 1″ wide nailed to a board. These are placed parallel to each other and are about 6″ apart. A damp cloth is spread over the board and strips. A ball of clay is then placed upon the damp cloth and is first pressed with the hands and then rolled down to the required thickness, the ⅜″ strips acting as guides. Superfluous clay may be scraped off with a knife as the rolling proceeds. When rolling the clay a damp cloth is placed between the clay and the rolling pin to prevent the clay from sticking to the rolling pin. This equipment is shown in Figure 3. When the sheet of clay is ready, a 5″ square is marked upon it by inverting the wooden form and impressing it into the clay. The square is then cut out with a knife and is placed in the bottom of the form. The 5″ paper square, cut from the squared paper and upon which the design was drawn is now placed in the form upon the sheet of damp clay. A blunt pointed pencil is now used to trace the design which is impressed into the clay as is shown in Figure 2, C.

Little canals or ditches are now dug into the soft damp clay that the decoration may be produced by the flowing of cement into these. Digging is easily accomplished with a pine stick whittled at one end to a wedge shape. A piece of ¼″ dowel rod about 5″ long makes an excellent tool for this purpose, Figure 3. Before beginning to dig, one must decide just where to remove the clay and where not to remove it. The first time cement is to be poured into the form the tile proper is to be cast. The second time, the cement is poured over the tile proper and the depressions are filled, the inlay being formed. This must be considered before the first pouring. Then the pupil will see that a little wall all the way around the tile must be provided for in the making of the clay mould prior to the first pouring. To provide for such a wall the line around the outside of the design must be dug out in the clay sheet. As soon as this has been done there will be no further difficulty in deciding which part should be dug out and which should be left. The ditches are dug to a depth of ¼″ and are kept as true as possible at the bottom because the top of the finished tile is cast in the bottom of the form, Figure 2, D. The depth of these ditches will add ¼″ to the thickness of the tile, making it 1″ in thickness when finished.

If the form is not to be used at once it is put away with a damp cloth over it that the clay may not dry out or shrink. If this were not done the clay would shrink and would no longer fit the wooden form. If the water were allowed to dry out of the clay it would no longer be fit to use to cast cement on because the clay

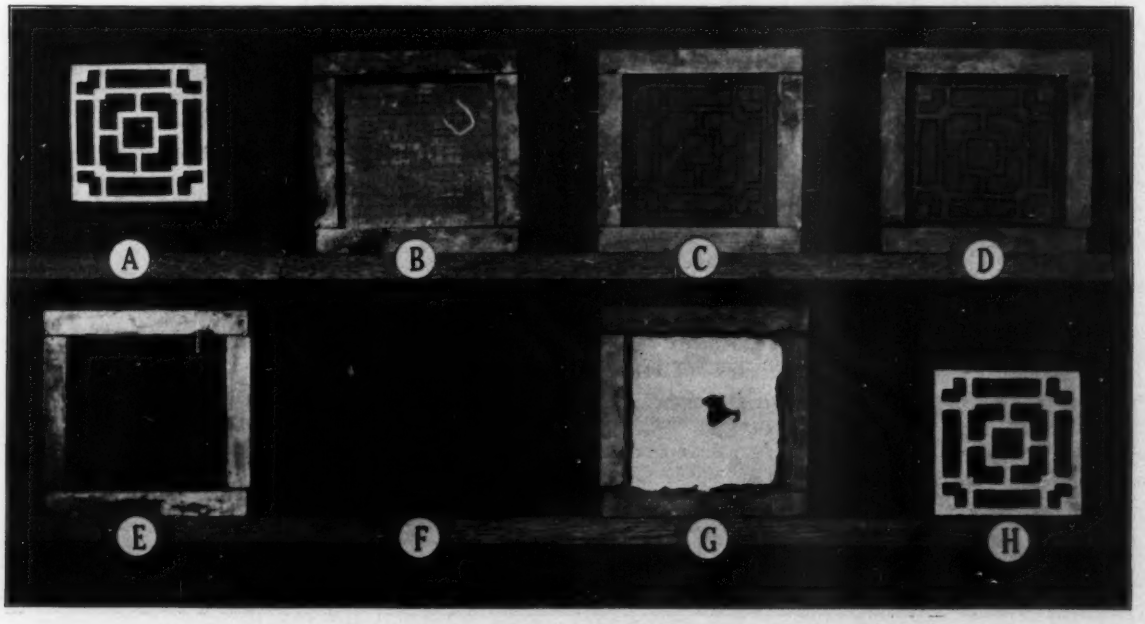


Fig. 2. Steps in the Making of Tiles.

Fig. 3. Preparing Molds.

Fig. 4. Finishing Tiles.

would absorb water from the cement and prevent the chemical action of hardening or setting.

A color scheme is now chosen, the black spots of the design representing a dark color; the white spots, a light color. All will agree that the dark color looks best upon the outside of the design to hold it together. If the outside of the design is to be dark, it follows that the dark color is the one to be poured first. A great variety of colors can be produced by using the ordinary painters' colors, which may be obtained from any paint or hardware store. Lamp black, ultramarine blue, yellow ochre, burnt umber, and Venitian red, are all good colors. They should be mixed with dry cement first. This mixture is then mixed with water. Two or more colors may be mixed together to produce new colors. Lamp black serves to gray the colors. Too much color in proportion to the amount of cement used should be avoided if the tile is to become hard. Beautiful color combinations may be chosen from Japanese prints or from modern magazine illustrations which are good in color. These color schemes may be matched by comparison using the dry mixture of color and cement. The first batch of colored cement (the darker color) is now poured slowly into the form and it flows down into the little ditches, being about as stiff as a thin batter. Care is taken to break all air bubbles which are poured into the form. The form poured full of cement is shown in Figure 2, E. It is now covered with a wet cloth to prevent drying out. The cloth is kept wet and the work is allowed to remain undisturbed for perhaps three days. The cement is fairly hard at the end of twelve hours but it is best to give it at least three days to harden. With a claw hammer the nails of the form are removed and the screws are taken out if necessary, altho sometimes the tile and clay will slide out after the two nailed pieces are removed. Care must be taken that the pressure from the hammer is so placed as not to chip or crack the tile. This may be guarded against by prying against the bottom board of the form. After the tile with the clay clinging to it is taken from the form, the clay is removed from the cement by breaking off some of it from between the cement ridges with the wooden tool before referred to. The cement is now washed clean with the stiff brush and appears as shown in Figure 2, F. The tile is now placed in water and is allowed to remain in this bath for several days, six or seven days being none too long if this amount of time can be allowed. Of course the reason for leaving the tile in water is that the cement may continue to get hard until chemical action ceases. This action will cease as soon as the water dries out.

The tile is now taken out of the bath and the superfluous water is brushed off. It is placed back into the wooden form while it is still wet, this time with the decorated side up. The second color of cement is mixed and poured over the tile, filling all the little ditches, Figure 2, G. Care is taken not to pour any more cement than is needed, because all superfluous material will have to be ground off later. It is now treated in the same manner as before, altho less time may be allowed for the setting and seasoning.

In order to increase the strength of the tile it is well to reinforce it with wire screen of ¼ inch mesh. If this cannot be obtained, ordinary wire fly screen may be used. After the first pouring of cement into the form, shown in Figure 2, E, a square piece of screen 4¾″x4¾″ is placed upon the soft cement and is worked down into it until it is about ¼″ below the surface. Care must be taken that this sheet of screen is equally distant from the four sides of the form, in order that ⅛″ may be allowed all the way round for the final grinding of the edges. A tile reinforced in this way should be many times as strong as one in which no reinforcing whatever has been used.

After tile and inlay are both thoroly hard the tile is ground smooth with a Carborundum stone. It is

placed flat upon a board and is ground off by rotating the stone as shown in Figure 4. Both stone and cement are kept wet, the tile being washed frequently with the bristle brush that the progress of grinding may be observed. As soon as all lines of the design have come clear the grinding is discontinued. Figure 2 H shows our finished tile. The edges are ground square by placing the Carborundum stone down upon the board and against the edge of the tile as shown in Figure 4. If desired, the edges of the tile may be beveled by slightly tilting the stone.

Helpful References.

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L. L. Winslow: An Investigation of Cement and Concrete; and The Relationship between Content and Manipulation. Illustrated by work in Concrete: Manual Training Magazine, October, 1913, and February, 1914. Also Cement and Concrete—An Industrial Unit for the Eighth Grade, contained in Art and Industry in Education. Published at Teachers College, Columbia University, 1913.

Editors' Note—On receipt of the above we wrote to Mr. Winslow asking if he did not mix any sand with the cement, and if the problem would not be simpler if the grooves were cut entirely thru the clay, allowing the bottom of the mold to shape the top of the tile. In reply, he says:

"No, we did not mix any sand with our cement in making the tile altho one might do so if desired. A tile of pure cement and water or mixed *neat* as the mason would say, is stronger than any tile made by a mixture of cement, sand, and water. The cement used in the Singer Tower in New York City was subject to a thoro test. I quote from 'A History of the Singer Building Construction,' edited by O. F. Semsch for the Singer Company. 'It. (the Portland Cement) had to show a minimum tensile strength per square inch of 200 pounds when mixed neat; and after setting one day in the air until hard and in water the rest of the time. 500 pounds after seven days and 540 pounds after twenty-eight days. When mixed with three parts of sand it had to show a strength after seven days, of 165 pounds.'

"I have just been experimenting with your suggested method of cutting thru the clay in the form to the wood, making the grooves ⅝″ deep. In some designs this would undoubtedly be the best method to follow providing that the outside groove be cut last. But the trouble seems to be that the clay works loose in the form and does not remain in place when some designs are worked out. I think this method should be mentioned as being best in designs similar to the one worked out in Figure two, lace designs where the parts will hold each other in place. If the clay grooves be dug entirely thru the clay sheets, it would be just as well to have the sheets ¼″ thick instead of ⅜″. This would make cutting an easier matter."

ELEMENTARY MECHANISMS

Ray F. Kuns, Cincinnati, O.

(Second Article)

Blowers.

THESE are used for blowing forge fires or gas blow pipes. Several types are shown on Plate 4 either of which will do good work. In designing all blowers it must be remembered that the combined area of all inlets should be larger than that of the outlet. The outlet should never be made quite small as this is sure to result in a very poor draft. Even with a speed of 3000 revolutions per minute (R. P. M.) very little if any real compression of the air will take place and consequently the same fan will give twice the current with the doubling of the area in the outlet.

Hand Operation. There are many devices which can be arranged to give the necessary speed such as a series of spur gears or belt wheels or a combination of the two. An old buggy wheel mounted on its spindle and having a handle fastened to one of the spokes forms a very serviceable arrangement. If the tire is a flat one, a flat belt would be best, while if it is a channel tire a round belt is to be preferred. In any case the pulley on the blower shaft should be one suitable to the form of belt used and not over two inches in diameter. By keeping it small a speed of from 1200-1500 R. P. M. can be secured. The rear wheel of an old bicycle together with its chain, sprocket wheels and a pedal for the crank can be converted into a splendid driving arrangement with a little careful planning.

Blower Type A.

Case. The construction of this blower requires the use of the lathe. Six soft wood boards are glued and nailed together in two sets of three each. Be careful in placing the nails so as not to have them interfere with the turning later on. When the glue is dry the parts can be fastened on the face plate of the lathe and inside turned as shown in the cross section. After the turning has been completed the inlets, two on each side of the case, may be laid off and cut out. The halves of the case are next bolted together and the outlet laid off, after which they may be taken apart again and the outlet is shaped up.

Fan. The method of constructing this is clearly shown. If seasoned wood has been used for the case 1/16″ clearance will be sufficient for the fan. After the shaft has been placed in position the fan may be tested to see if it is balanced. To do this set two straight-edge boards on the bench and place the fan between them with the ends of the shaft resting on the edges of the boards. If the fan in this position will stand with any blade up it is correctly balanced. However, if it persists in coming to rest with one certain blade down, then that blade is too heavy and some of the weight should be removed or counterbalanced on the opposite blade. There are several methods for doing this. One is to rivet on the necessary weight, the other is to run on solder until the fan is perfectly balanced.

Shaft. This is a piece of ½″ cold rolled steel eight inches long. It should fit into the fan very closely. When properly placed a 3/16″ hole should be drilled thru fan and shaft and a pin placed in it to keep them together.

Bearings. The drawing shows these babbitted. This method may be followed or brass tubing of ½″ inside diameter may be used. In any case oil holes should be provided.

Base. The design shown is merely a suggestion. The builder will have to meet the requirements of his particular job.

Horn. As shown this is arranged for attaching a piece of garden hose. It is fastened on to the case with

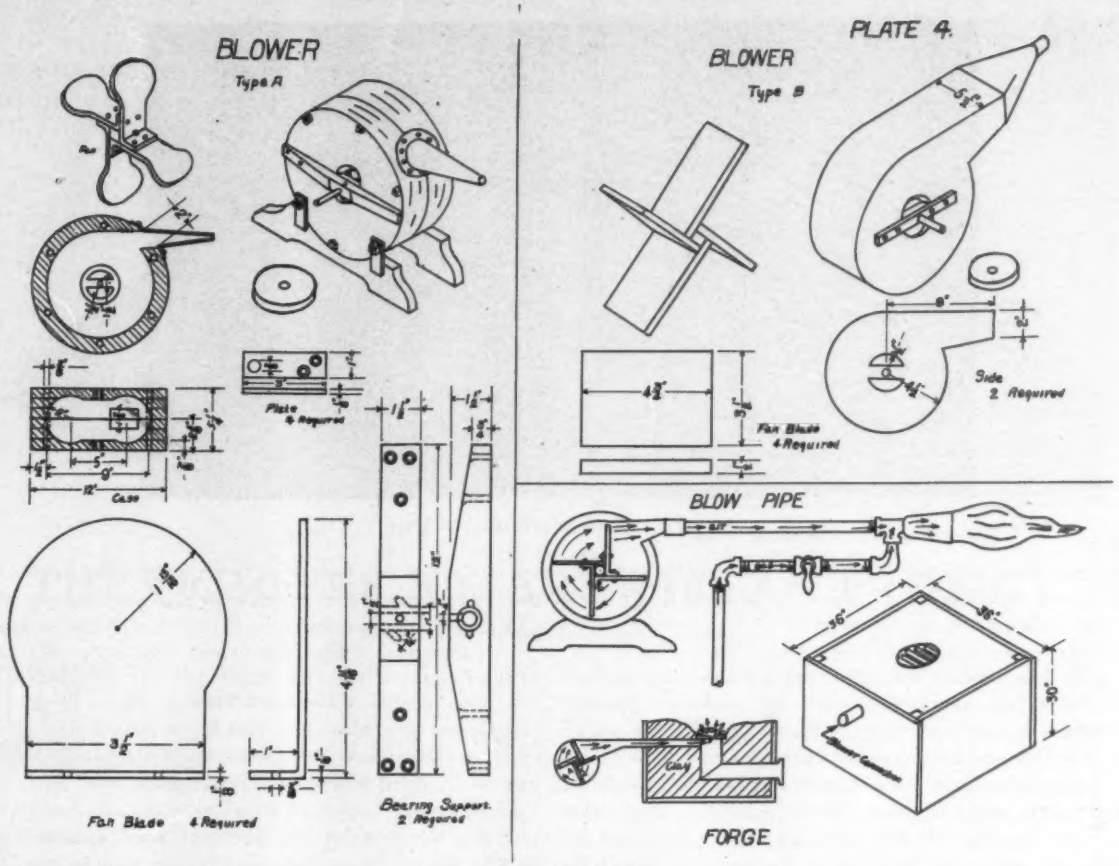


Plate 4. Details of Blowers.

screws. The design of this may be changed to suit conditions.

Blower Type B.

Case. The case of this consists of the two sides of 7/8" wood shaped up as shown and covered with tin or sheet iron. Old cans or buckets will furnish this material. A tin horn is worked up for the end of it. The tin on the case may be either nailed or fastened with screws. The latter method is best as it permits of the fan's being removed in case of trouble without spoiling the case.

Fan. This may be worked up from wood as shown or with a little more time a better fan may be made from sheet iron. In any event it must closely conform to the shape of the inside of the case. If wood is used, nails, screws, and glue should all be used in fastening it together to remove all danger of its coming to pieces when in use. With this one precaution wood makes a serviceable fan.

Bearings. Note bearings on Type A.

Blow Pipe.

This is of a suitable design for a gas flame to be used in heating metals and for tool tempering. One-half inch gas pipe is ordinarily used; however, if a larger flame is desired it is only necessary to increase the size of the air pipe, unless this should go over an inch when the size of the gas pipe must be increased accordingly. While a valve on the air line would be a convenience it can be omitted.

Burners. One type of burner is shown. This is a piece of sheet iron worked up as shown and having the edge crimped over the edge of the tee. Another type of burner which is almost equally satisfactory for most purposes and better for use in a furnace or muffle can be made as follows. A piece of 1/2" gas pipe a foot or more long as required for the particular job has both ends threaded. One end of the pipe is closed with a cap while the other end is turned into the open end of the tee which is shown in the drawing with the other style of burner crimped over it. A number of 1/8" holes are drilled in the pipe just back of the cap. These should be placed in rows and from 1/2" to 1" apart.

By building a furnace of fire brick the heat is conserved and iron can be heated to a good white heat once the furnace is warm. Either of these burners will give a brazing heat but not ordinarily a welding heat.

Forge.

This is a very simple and, at the same time, a fairly serviceable forge. An old packing case may be used for the base of the forge or the box may be built up to the dimensions given. Next secure a piece of two inch or three inch gas pipe or spouting and cut a hole in the side of the box for it. This is for the air pipe. Next secure an old galvanized iron bucket or old sewer

BLOWER IN THE OYLER SCHOOL SHOP.

tile and cut a hole in the side of it for the other end of the pipe. Next secure a piece of flat iron or tiling with a two inch hole in the center of it. Also secure another piece of sewer tile or old stove pipe. This piece is the one used to connect the outside of the box with the tile in the center and will permit all cinders dropping thru to be easily removed. Place all of these parts in position and fill in around them with clay. While red clay is perhaps the best material for this, earth of any nature will do. Pack this in carefully, being sure to cover the edges of the plate but not the center of it. A sort of basin should be left in the center of the forge with the opening in the center of the plate at its bottom. Lay some iron bars across the basin close to the bottom having the ends of them imbedded in the clay. These bars must be fairly close together for if coals are allowed to get under them they will be melted out while otherwise the draft of air striking them will keep them cool. If fire clay is available it might be used in forming the basin. In case none of this can be obtained, a little cement may be added to the red clay and a thick mortar formed which will answer very well for this purpose. Even a thick mortar formed of the red clay alone will do, however it will not hold its shape as long as either of the others.

After the fire has been going in the forge for a short time it would be well to examine the iron bars to see if there is any danger of their being melted out. If they show signs of this there is too much surface exposed and this should be reduced by filling in with the mortar.

Either one of the blowers can readily be attached to the forge.

Dies and Taps.

These will repay the grade shop for some effort in securing. It is usually necessary to purchase them direct, however a considerable saving can sometimes be made by making the holders in the shop.

Die Holders. A piece of hard wood wide enough to take the die in its center and allow from ¼″ to ½″ on each side of it when die is in place is worked out. This should be about twenty inches long and the ends worked down for handles. The die is held in position in the center by means of babbitt.

Tap Holders. While a wrench can be used for this it is better to make handles from iron. ¼″x1″ iron does very well for this. These handles should be from twelve to eighteen inches long depending on the size of the tap and have a square hole in the center to just take the tap shank.

If holders are worked out for each tap and die it will be found a great convenience in keeping track of them as well as saving time in their use.

The sizes of taps and dies should ordinarily run from 3/16″ to ½″ inclusive.

Every man is my master in at least one thing, and in that I hope to learn of him.—Emerson.

Fig. 4. A Suggestion for a Six-Sided Dome.

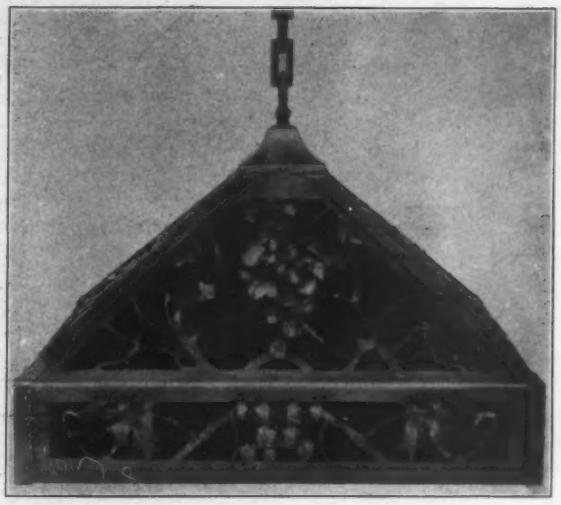


Fig. 1. Photograph of the Dome Described.

THE DOME AS AN ART METAL PROJECT

Ralph F. Windoes, Davenport, Iowa

AMONG the larger art craft projects, the dome has sometimes been looked upon as being too difficult for the average high-school student to attempt. This is a mistaken idea, as the processes involved in its making are, in themselves, of the simplest—sawing, cutting, bending, raising, riveting, and soldering—altho the latter *can* be done away with entirely.

For illustration, we have selected the four-sided electric dome with the grape motive, Figure 1. The working drawing, Figure 2, will guide us in the making.

The first step, of course, is the making of the full-size pattern of one side. It should be drawn out on tracing paper according to the dimensions shown upon the drawing, allowing for all bends, etc. In Figure 2, we have shown but half of the design, but the student will draw it out complete.

It will require four pieces of 20-gauge copper or brass, 11¼″ by 16″ to work up the sides. Paste the pattern on the upper piece, and rivet the four pieces together, putting the rivets in the waste material. Between each sheet of brass, lay a sheet of waxed paper to lubricate the saw as it passes thru. This paper can be prepared by melting paraffine in a shallow dish, and drawing the paper thru it.

Next drill a hole in each open space and saw out the design. Directions for sawing have been given so often, and are so familiar that it is unnecessary to repeat them here.*

When the sawing and filing have been completed, cut out each side separately with the shears, and file the edges square. Do not bend at this point.

The next step in the making should be the square top piece. It is "raised" to shape by beating it with the neck hammer. Procure a piece of 18-gauge metal 6½″ square and draw pencil lines in 1″ from each edge, making a square 4½″ on each side as shown at A, Figure 3. "Raise" this square over the edge of a block of hardwood, forming a tray about ¾″ deep, as B illustrates. On the bottom of this tray, inside, draw diagonals with a pencil. Procure a small block of maple, and with a V-gouge cut a depression in one end about ½″ deep. Fastening this block in the vise, hold the piece over the depression and beat the metal along the pencil lines, leaving the center where the lines cross flat. Raise it in this way about 2″, and it will assume the appearance of C, Figure 3. It may be used on the dome in this shape, or the sides may be slightly rounded by hammering from the inside over a rounded piece of wood. The photograph shows a dome with a top of the latter shape. Of course the piece will need to be "annealed" a number of times, as the excessive hammering will make the metal rather hard.

After the top has been made, it will be found that the sides have been drawn in at their centers, so cut

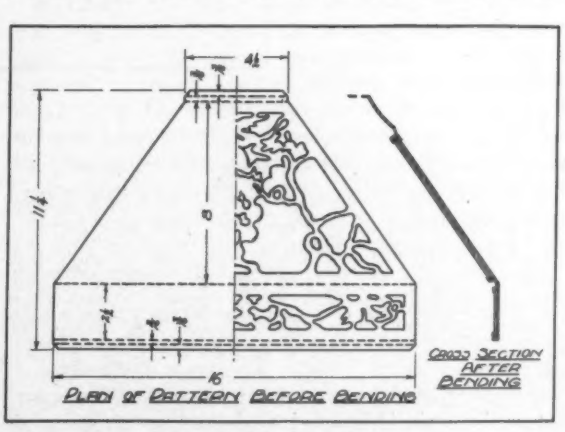


Fig. 2. Working Drawing of Dome.

*See article on pages 17 and 18 of the January, 1914, issue of this magazine

them off straight with the shears, and saw a hole 3/8" in diameter in the flat top.

You may now begin to assemble. As shown in the cross section in Figure 2, the pieces of glass are held at the top of the upper panel and the bottom of the lower by bending in the edges of the metal at these points. At the point of the bend they are held with small brass fasteners, such as the one at D, in Figure 3. It is recommended that these be soldered in place, but if the student is not sure of his soldering ability, they may be held with a rivet each. Two fasteners for each piece of glass are all that are necessary.

The next step is the bending of the bottom edge to receive the glass. The first bend can be made by hammering the metal at right angles between two boards held in the vise—a familiar process. The return bend can be easily made by hammering over a piece of iron or steel about 3-16" thick, which is slipped in where the glass will be placed later. *Do not bend* the upper edge at this point, as the top piece has to be riveted in place first.

Next rivet the sides of the dome together with strips of brass about 1" wide and bent at the middle. Use separate short pieces for the border and do this riveting first. Make the bends between the boards held in the vise, as straight bends are essential. The lower edges of the long strips must be cut at an angle to mitre nicely with the upper edges of the short strips. An easy way to do this is to cut the upper strips a little long, and file them to fit before putting in the bottom rivets. With these strips holding the sides together, rivet the top in place, as shown in the photograph. And lastly, bend the top edges of the sides to hold the glass, with the pliers.

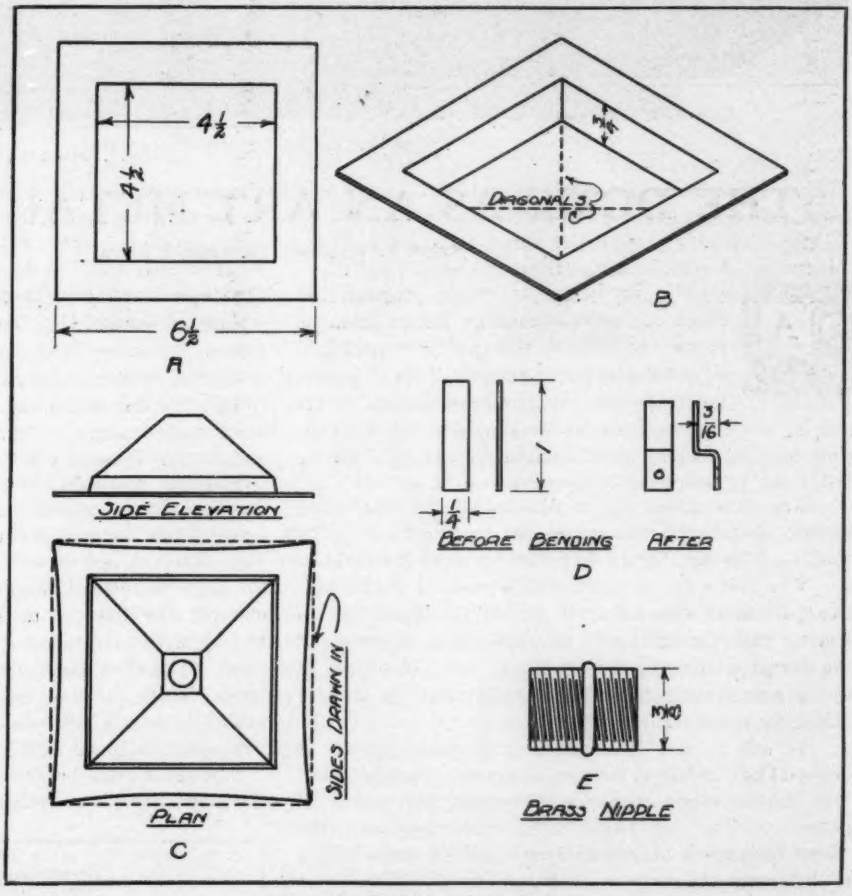


Fig. 3. Details of Construction of Dome.

Thru the 3/8" hole cut in the top, run a brass nipple such as illustrated at E, Figure 3. This may be purchased from any dealer in electric supplies for about ten cents. It is threaded at both ends, the lower to receive the lamp socket, and the upper the hanger from which the dome is suspended. This may also be purchased ready made from the dealer. The chain illustrated is a suggestion—the stores carry a great variety. The upper end of the chain is fastened to the ceiling by means of a hanger similar to the one on the dome, and this, in turn, is fastened to a square piece of wood screwed into the ceiling.

We now come to the finishing. Place the dome on a piece of soft wood and with the ball pien of your hammer carefully "raise" the grapes and foliage by pounding them out from the inside a little.

In regard to the coloring of the piece—we will leave it to the student. He will surely want it to harmonize with the other furnishings in the room where it will be placed, so the choice is left to him. A plain, brushed finish, tho, carefully waxed or lacquered, will prove very acceptable to the furnishings of any home.

A word about the glass. If possible it is much better to take the dome to the dealer and have him fit the glass in place than to send in the dimensions for it, but if this is impossible, send him a full size pattern, cut from cardboard, of each piece wanted. If the grape motive has been followed as here suggested, secure the glass with green and purple colors predominating.

In Figure 4 is shown a photograph of a six-sided dome with the beetle as a motive. In general, it is made exactly as the one described except the top piece. In this particular example, the top is soldered up from six pieces, tho it could be riveted together with strips. The over-all dimensions for this dome are as follows: 14" sides, 10½" high, and 28" spread.

Fig. 5. The Woolworth Building as a Fine Example of Structural Design. The Vertical Idea Dominates both Structure and Ornament.

Fig. 6. Detail of Inside Front Door of the Nichols House, Salem, Mass. Door designed by Samuel McIntire, Architect, 1782. Photograph Copyright by Frank Cousins.

PROBLEMS IN DESIGN

Bonnie E. Snow, Millburn, N. J.

(Lesson VI. Structural Design)

DESIGN is a big subject. It touches all phases of Art and all forms of construction, hence any definition of design must be all-comprehensive. Design is not ornament or decoration any more than it is construction, proportion and color. It must cover all of these phases of man's work. Design is the tangible and definite expression of an idea. In these articles it has been already defined as the selection and arrangement of lines, shapes and tones in suitable materials for purposes of use and beauty. Design is thus fundamental to the planning of the Woolworth building and to the Brooklyn Bridge, just as definitely as it is to the planning of a rhythmic border or a surface repeat; for the Woolworth building is an arrangement, in suitable materials, of lines, shapes and tones, and this arrangement is governed by the principles of order—rhythm, balance, variety, unity, etc. These principles are usually presented to students in problems that can be worked out in simple materials, so that in the schools we are apt to think of design as affecting abstract drawings, planned for decorative purposes, and to look for "applied" design only in such things as table-runners, stencilled bags, leather music rolls and watch-fobs. It is well for us to remind ourselves of the truth that sincere and straightforward mechanical arts have as high a claim upon our respect and admiration as have the so-called fine arts. If we are true to the spirit of our own times we will try to express the needs of those times in as worthy and fine a way as possible. The Greeks expressed the life and spirit of their times in building beautiful temples for their gods, and in carving statues that should be so refined and lovely in their proportions as to fitly express an idea of the divinity with which they believed these gods were invested. But the ideals of American life and spirit are not identical with the ideals of ancient Greece. Why, then, should we mourn our inability to develop a national art that is based on the forms of Greek expression? The true artist is the man who tries to do with his own times what the Greek did with his, expressing the need of the hour sincerely and honestly and making that expression as beautiful as he is able. In the year 1914, we do not build in America a Parthenon for a goddess; we build Panama canals, railroads, steamships, gigantic office buildings and hotels. "We may wish," says Gerald Stanley Lee "that the Parthenons and cathedrals were within our souls; but what the cathedral said of an age that had a cathedral mood, with its thrones and popes, we are bound to say in some stupendous fashion of our own—something which when it is built at last will be left worshipping on the ground

beneath the sky when we are dead, as a memorial that we, too, have lived."

In the problems which have preceded this lesson the principle of Rhythm has been developed in borders and surface patterns. Rhythm has been defined as related movement. It is that form of movement in which the lines seem to melt or flow, without conflict, in one general direction. Rhythmic lines are lines of grace, of easy transition and subtlety. There are other lines of movement, however, that often enter into the consideration of a design. When a line extending definitely in one direction meets another line extending in an opposite direction the movement is arrested, and a new force or principle becomes apparent—the principle of Opposition

Fig. 1.

Fig. 2.

(Fig. 1). When Opposition results from the meeting of vertical and horizontal lines we are conscious of a feeling of stability and strength. A tree growing from the plain, the steel structure of a building rising from the level ground, a lintel resting upon its vertical supports (Figs. 2, 3, 4) are illustrations in point. Lines

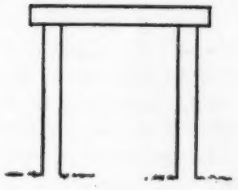


Fig. 3.

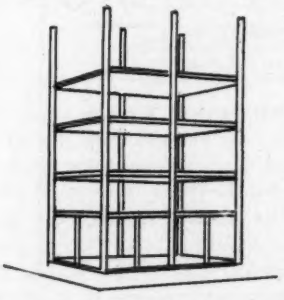


Fig. 4.

of Opposition are structural rather than rhythmic. Structural design, then, is that phase of design that emphasizes or repeats the structural elements. In the Woolworth building, that proud achievement of modern times (Fig. 5) the main divisions of the structure, the secondary divisions of windows and doors, and lastly the decorative elements, all repeat the dominant movement or idea of the building, which is vertical. When the lines and contours of a constructed object are permitted to dominate the decoration of that object, an effect of simplicity and of restraint is generally obtained. For example, the dignified beauty of the Colonial doorway (Fig. 6) is due to its fine proportion and to the use of structural lines. We obtain in this way panels, margins and spaces, all in fine relation to each other. No additional ornament is desirable. The diagrammatic book-cover shown in Fig. 7 is another example of the decorative use of structural elements; the outside rectangle encloses an inner rectangle which repeats the structural elements, as does the small rectangle to be filled by the title.

In the planning of school problems a greater proportion of successful results will be obtained if we base

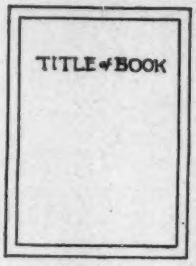


Fig. 7.

our decoration on structural design. By hedging students about with its restrictions, we prevent them from employing unrelated and unrestful elements. We avoid realism, and we establish a simple mode of treatment. Structural design seldom results in fussiness or over decoration. Its technique, when carried out in

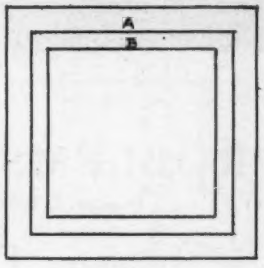


Fig. 8.

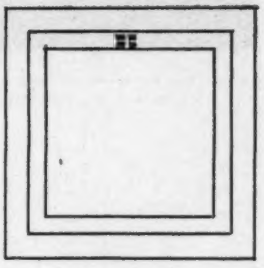


Fig. 9.

needlework, in metalry, in weaving, modeling, carving, etc., is also more easily mastered by the young student.

Problem: A Square Pincushion Cover. Let us take for our first problem in structural design a decorative arrangement to be carried out in needlework. A pincushion is a useful article and should be made beauti-

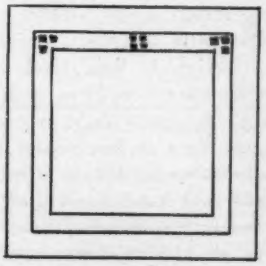


Fig. 10.

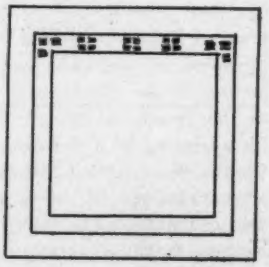


Fig. 11.

ful. A five inch square should be drawn on white paper. Following out the idea of structural design, two concentric squares (Fig. 8) are drawn within. For the sake of obtaining variety in our design, the distances between these concentric squares should be unequal. (Compare the space A with the space B, and note the

Figs. 14-15. PINCUSHIONS.

difference. Let us select space B for the placing of our decorative element, a border. We will decide upon a "structural" unit—a square, or a group of squares—and place this unit midway between the two corners, as a first step (Fig. 9). The next step, naturally, is the placing of the same or a similar unit in the corners (Fig. 10). The remaining distances must then be adequately filled by the repetition of the same unit used at first (Fig. 11). It may then be necessary to use a connecting element as in Fig. 12. Fig. 13 shows another arrangement, developed thru a similar process.

When the entire design is drawn within the square, a transfer may be made to fine white crash or scrim. Figs. 14 and 15 show two completed projects. The embroidery was done with "D. M. C." cotton. In Fig. 14 the color scheme was monochromatic,—two values of blue, worked on white. A complementary scheme of blue and orange was selected for the embroidery in Fig. 15. If in our public school courses, the art department and the sewing department could dovetail in the manner indicated by this lesson the question "Why teach Art in the public schools?" would never be asked.

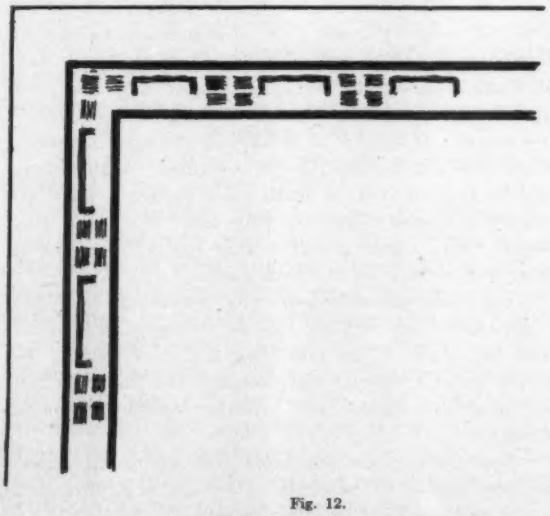


Fig. 12.

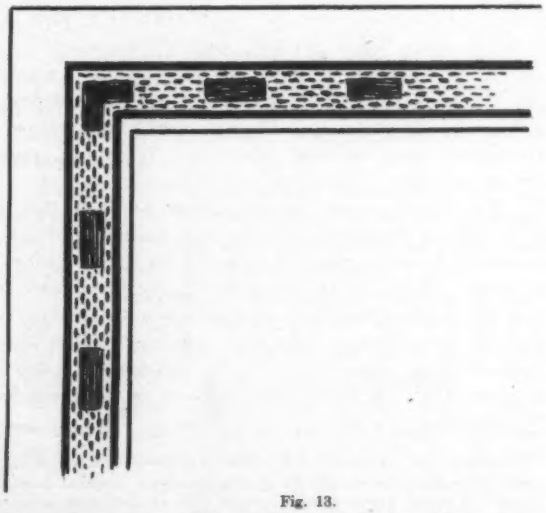


Fig. 13.

Two Designs for Pincushions. From the Department of Sewing, Newark Public Schools. Courtesy of Miss Carolyn Stephens, Supervisor.

VARNISH AND ITS TROUBLES

L. A. Crocker, Instructor, Continuation School, Milwaukee, Wis.

Necessary Tools.

THE necessary tools for wood finishing are as follows:

Powdered pumice stone.

Sandpaper—No. 0, ½, 1, 1½.

Curled hair.

Cotton waste, hemp, or flax tow for cleaning off fillers.

Rubbing felt.

Rubbing oil. This is made by mixing raw linseed oil with benzine—about two parts oil to one part benzine

Putty knife.

Varnish cup. A varnish cup that is much the same as an ordinary tin drinking cup will give good satisfaction. It should be made of heavy weight tin, with a diameter of 4½ to 5 inches and about 5 inches deep.

Picking sticks. These can be made from old buggy spokes. They should be about eight inches long, sharpened to a round point at one end and to a chisel point at the other. These sticks are helpful for cleaning filler from beads, molding, etc. They should be kept reasonably sharp.

Rubbing brush. A rubbing brush is used for rubbing beads, mouldings, etc. A stump of an old paint brush, well cleaned, will answer for this.

Painter's duster.

Varnish brushes. The selection of these is largely a matter of taste. It is the general opinion of practical workmen, however, that a three inch, flat-chisel, double-thick, Chinese bristle brush will give good general satisfaction. In addition to a brush of this kind, the finisher should also have an inch-and-a-half brush for cleaning up runs, getting into corners, and general cutting in.

Nature and Varieties of Wood.

All kinds of wood are made up of thread-like fibers. These fibers are very coarse in some woods, while in others they are fine. When they are coarse the wood is said to be "open grained." When, on the contrary, they are fine it is known as "close grained." From the finisher's standpoint, therefore, woods can be divided into two classes—"open grained" and "close grained."

There are many varieties of "open grained" woods, but the most commonly used are: oak, ash, walnut, mahogany, and rosewood. The principal "close grained" woods are: pine, cypress, gum, birch, sycamore, maple whitewood, cherry, redwood, and cedar.

The "open grained" woods present a surface that is, in reality, a succession of hills and valleys, and it is necessary to use a paste filler to fill up these "valleys" or pores. A proper application of paste filler produces a uniformly level surface, so that when the varnish is applied, it in turn will be even and level. The "close grained" wood, whose structure is much finer knit, needs no paste filler. A liquid filler, however, is recommended for this class of wood.

Editors' Note—The author of this article is an instructor in woodworking in the Milwaukee Continuation School and a graduate of the Course for Teachers of Trades, University of Wisconsin. He has had many years experience as a cabinet maker, and a finisher of fine furniture and cabinet work.

Sandpapering and Preparing the Surfaces.

Before any finish is applied, the woodwork should be scraped and sandpapered with No. 1 sandpaper in order to remove plane marks, etc. Strictly speaking this operation belongs to the carpenter; but in most cases the wood finisher has to do some of it. There are two important points to be borne in mind in sandpapering:

First—Never rub across the grain of the wood—always go with it.

Second—Never bear so hard upon the edges that these will be rounded off.

When the woodwork has been sandpapered, it should be thoroly dusted. To make sure that it is clean go over it a second time, and do not give up until you are sure that there is not a particle of dust left on it. A little extra care taken at the beginning will save a lot of trouble later when you apply the varnish. Finger marks and dirt stains can be cleaned off by rubbing with benzine and a rag or with benzine and sandpaper. Stains can be removed with a solution of oxalic acid and hot water. Care must be taken to see that the oxalic acid itself be cleaned off, else it will cause trouble. Go over the spot where the oxalic acid has been used with a little vinegar, and when dry, go over it again with some clean benzine and a rag. Allow it to become thoroly dry before filling.

Stains and Staining.

Novel and attractive effects may be produced by staining. Stains are used to darken the high lights of wood preparatory to the application of a relatively lighter filler. By varying the intensity of the stain different results may be obtained with the same color of filler. Stains are also used without fillers. There are three kinds of stain; water, oil, and spirit. Each has its advantages and its disadvantages.

Water stains are cheap, penetrate the wood deeply and are transparent. They cause the grain of the wood to "rough up" however and for this reason are used mainly upon hardwoods which require darkening before the application of a filler. Where water stain is not to be followed by a filler, it is customary to thoroly moisten the surface with water. After this has dried the surface is sanded with fine paper and the stain applied. The stain does not raise the grain as it otherwise would. If filler is to be applied the wood is sanded before it is put on, and after it is stained. Water stains may be applied with a brush or a sponge. They are sometimes heated that they may enter the wood more deeply. Any coloring matter that can be dissolved in water will make a wood dye or stain.

Oil stains are more generally used where no filling is desired. They are the easiest to apply and do not raise the grain of the wood like the other stains. On the other hand they do not penetrate and therefore cannot color hard woods dark. Neither do they give clear effects.

Spirit stains are but little used where surfaces of any size are to be covered. They are expensive, fade easily, and are hard to apply evenly.

A stain which penetrates deeply and is clear is obtained by placing the wood in a closed receptacle in which is a dish of concentrated ammonia. The fumes of this liquid causes a chemical change to take place, giving to the wood a rich nut-brown color.

Wax

An old form of finish that has recently become popular again is that of waxing. Rapid drying and hardening waxes can be purchased. They require a smooth surface and a very thin application for a successful result. They are usually placed over stains where a dull finish is required. A good wax may be obtained by cutting beeswax with turpentine.

Importance of Good Materials.

The importance of proper material—fillers and varnishes—for interior finishing can hardly be estimated. The fact that many people consider all fillers and varnishes alike accounts for the many poorly finished homes. So long as a nice, glossy finish is produced to start with, the average consumer is satisfied. Usually he pays no attention to the question of durability. This results in the use of many low grade, low priced brands.

In fillers and varnishes, as in nearly everything else, the so-called "cheap" materials are the most expensive in the end. They quickly mar and turn white, need refinishing in a season or two, and are in every way a source of dissatisfaction and expense. Money spent for low priced, adulterated materials is worse than wasted.

Fillers.

A silex or silica filler being a mineral substance will not decay or shrink. It dries very hard, sandpapers well, and leaves the surface in a good shape to receive varnish. It was long the custom to manufacture fillers from corn starch and other vegetable matter. Fillers are in the paste form and the liquid. The liquid is made by diluting the paste filler with turpentine. Varnish will not scale from a good filler, as is often the case where a low-grade filler or shellac is used.

Filler is the coat underlying the varnish. The filler is the most important coat of all, and at the same time it is one that usually receives the least amount of attention. Filler is the same to varnish, as the primer is to paint—it is the foundation—and it is impossible to get a good job if the foundation is not right. Do not use cheap fillers or shellac of any kind.

Applying Fillers.

The wood having been properly sandpapered and dusted, it is now ready to be filled.

All open-grained wood, i. e., oak, ash, walnut, etc., must be filled with paste filler. When it has set, in from fifteen to thirty minutes, its appearance will be dry and grayish, it should be wiped off clean with tow, cotton waste, or old rags, and allowed to become thoroly dry. No filler should be left on the surface except what remains in the pores of the wood. Clean out the moldings, beads, etc., with the picking stick. After it has been wiped off, allow about two days to dry. Then sandpaper with No. 1 sandpaper and dust thoroly. Then go over the surface with some old rags dampened with benzine. This will take up all of the dust.

Shellac raises the grain, shows laps, is very brittle, and makes a very poor foundation for varnish.

The Making of Varnish.

The base of varnish is gum copal, or the fossil gum found in Zanzibar, Sierra Leone, New Zealand, and the Philippine Islands. When the gum is received in the varnish factory, it is broken up into pieces about the size of small egg coal. As it is being broken up, it is selected, for in one chunk of the amberlike material there may be both transparent and almost opaque streaks; the white transparent gum goes into the making of the best grades of varnish, and the dark-colored gum, into the poorer grades. After the gum copal is broken, it is run thru a series of hand sieves, which divide it into different sizes for convenience in handling. The gum is now ready for the kettle.

For first-class varnish, only Calcutta linseed oil is used. This oil is made from the flaxseed of India. The turpentine used for thinning the varnish is of the best and the purest grade. The fire is so regulated that the heat can be increased or decreased, and the melting gum is constantly stirred. After it has melted, a tool somewhat like an egg-beater is introduced and the melted gum is whipped, preparatory to letting in the boiled linseed oil. When the oil has been mixed with the liquid gum, the kettle is run back over the fire and the gum and oil are boiled again. Then it is set away to cool, after which the turpentine is mixed with the gum and oil, and the varnish is complete. The varnish is then strained thru cotton and put into storage tanks to age for from six months to two years.

Cheap varnishes are made from shellac and alcohol. Other cheap varnishes are made from resin or resinous substances mixed with alcohol, turpentine or various oils. The resinous substances most commonly used for varnishes are rosin, mastic, lac, amber and asphalt; and the solvents are fixed oil, volatile oil and alcohol.

Some Important Details.

The most important thing in varnishing is cleanliness. Everything must be thoroly clean. The surfaces to be varnished must be free from dust and dampness. There should be no draft, and it is well to sprinkle the floor of the room, in which the work is to be done, damp—not wet—as a wet floor might cause considerable trouble. Of course if the floor is to be finished it should be absolutely dry and clean. The brushes and varnish cup must be clean.

Before applying the varnish the surface should be sandpapered with No. 0 sandpaper, carefully dusted and wiped. All nail-holes and cracks should be puttied up with putty colored to match the wood.

The temperature of the room should be about 70° F. It is impossible to obtain the best results when it is much lower than that. Artificial heat must be resorted to if the finishing is being done in cold weather.

Some woods require more varnish than others. Three coats of varnish on a wood like poplar will show up no better than two coats on maple, but all good first class work on open grained woods should receive two good full-flowing coats of varnish, and close grained

woods, two coats. Of course a great deal of work may be done with fewer coats than the above but in order to get a first class job these are necessary.

Applying the Varnish.

Put the varnish on with a full brush, rubbing it out crosswise, if possible, finishing by laying it out up and down the grain. Varnish should be "flowed" on and not rubbed out. It should be flowed on heavy, without having it "run" or "sag." Practice alone can give one the habit of judging exactly how heavy it ought to be applied. The house painter will naturally have a tendency to rub varnish out too much and care must be taken not to do this. Paint should be rubbed out and varnish should be flowed on.

In applying a quick-setting varnish, always begin at the panels being careful not to touch the stiles more than is absolutely necessary so as to prevent showing a "lap." One of the advantages of good varnishes is that while they dry free from dust and harden quickly they do not "drag" under the brush nor "set" quickly. This gives the finisher plenty of time to go over the whole side of a door instead of being compelled to do it panel by panel.

Allow two days for the first coat of varnish to dry. Then rub it over lightly with curled hair. This will kill the gloss enough to enable the next coat to take hold better. If the surface is to be rubbed this should be done after the last coat has been allowed to stand two days.

There is a difference between a varnish being "dry" and a varnish being "hard." Varnish may be dry and still not be hard. Before any rubbing is done be sure and see that the varnish has had time enough to get hard.

Rubbing.

The best kind of a rubbing job can be obtained by using a piece of rubbing felt, dipping it into the rubbing oil and then into the powdered pumice, and rubbing the surface. Here are a few points that will be of assistance.

Do not rub crosswise—always rub with the grain of the wood.

Do not bear more heavily on one spot than on another.

Wait until the varnish is thoroly dry before rubbing, otherwise it will "sweat" and will have to be rubbed over again when dry.

Where it is necessary to rub a surface with as little expense as possible, this can be done by the following method: take a piece of No. 0 sandpaper large enough to fill the hand. Have two saucer-shaped dishes beside you, one of the dishes containing powdered pumice, and the other rubbing oil. Dip the sandpaper first into the rubbing oil, then into the pumice stone and rub. A surface can be rubbed by this method in a very short time, and a reasonably good finish obtained.

Floors.

The question as to how natural wood floors should be finished and kept in good condition is one of the most serious ones that confront the house owner. Manifestly it is impossible to produce any finish that will withstand indefinitely the hard wear to which all floor varnish is subjected. Steel shoe nails are harder than varnish gums, and the ordinary floor varnish soon mars or spots white. This means refinishing.

For new work treat it, as regards filler, as you would the other wood-work of the room and finally apply three coats of good floor varnish allowing each to thoroly dry before the next is applied; before the last coat is applied the surface should be rubbed lightly with curled hair. This is done to kill the gloss of the undercoat and allow the last coat to "take hold" better.

When the finish begins to show signs of wear clean the floor thoroly with warm water and soap. Allow it to get thoroly dry; then sandpaper with No. 0 sandpaper. Wipe off all dust and apply a coat of good floor varnish.

For old floors that have been waxed it is absolutely necessary to remove every particle of the wax before applying the varnish. The safest plan is to have the floor scraped and then finish the same as a new floor. Care must be taken to see that there is no wax on the floor before applying the varnish. Wax is of a greasy nature and any varnish applied to it is certain to come off. If the floors are dirty, clean them with soap and warm water.

Varnish Mishaps.

Even the occasional user of varnish has probably experienced, to his sorrow, one or more of the "mishaps" of varnish. Varnish, from the very nature of its ingredients, is one of the most sensitive commodities in the world. Unfavorable local conditions of the weather, surface, workmanship, or material will cause trouble. Satisfactory results require of the wood finisher a high degree of care and intelligence. While good fillers and varnish do not always mean satisfactory results, still in this as in everything else, the best is the cheapest in the end.

The following list of varnish mishaps, with explanations as to the cause and practical suggestions for preventing, will, if followed, save trouble and expense to all parties concerned.

Drying and Hardening.

Proper light and ventilation are necessary to facilitate drying and hardening. Varnish should not be applied in buildings that are damp or not properly heated in cold weather. The best results are obtained at a temperature of about 70° to 75° Fahrenheit.

Varnish should never be used if it has become chilled. Long exposure to cold weather may cause it to become "specky," in which event it is necessary to set it near a stove for some time until it has become warmed thru.

Varnish will work tough when it is chilled, or when applied on a chilly surface. It will also be considerably retarded in drying and hardening.

Extremely hot weather will also keep varnish soft for some time. Varnish will, of course, be heavier in consistency in cold weather than in warm weather.

The surfaces, brushes, etc., should be perfectly free from grease, soot, etc.

Each coat should be thoroly dry before applying succeeding coats, as good varnish dries from the outside in—that is, from the surface to the bottom. Therefore, do not make the mistake of applying following coats over a coat which is simply "surface dry."

Typical Varnish Troubles.

Blooming or going foggy is caused by dampness, moisture, or gases after the varnish has become hard. Recently applied varnish is particularly susceptible.

Blistering is caused by the exposure of newly varnished surfaces to extreme heat, or to the direct rays of a very hot sun, particularly so where the wood or undercoat contains moisture.

Blotching, Pitting, or Pocking is caused by varnishing over greasy, cold or damp surfaces. It is also caused by improper thinning material, or when the under-coat is porous.

Bubbling or foaming is caused by the newness of varnish, and can be remedied by opening the can for a short time, in a warm place. The opening of the can should be covered with thin gauze to exclude dust.

Brush marks are caused by varnish being brushed too long when applied. Very quick drying varnish is liable to show brush marks.

Brittleness in varnish means, to put it plainly, inferiority. Do not use a brittle varnish if you want good results.

Chilling is caused by exposure to drafts of cold air before the varnish has dried. Also, varnish which has been left standing in a cold warehouse frequently causes specky spots when applied. Stop the work and allow the varnish to become thoroly warmed.

Crawling means that the gloss of the under-coat has not been killed sufficiently to enable the second coat to "take hold." Varnish applied on greasy or cold surfaces will crawl. Very often chamois skins are used for wiping the hands. The chamois gets greasy and soapy and when used as is frequently done to wipe a varnished surface, will deposit more or less soap and greasy matter thus causing crawling. An oily varnish will crawl much more readily than a varnish that does not contain much oil. In fact, almost the same thing that makes paint crawl will make varnish crawl.

Crimping, Wrinkling, or Sagging. This is caused by applying the varnish too heavily, or by exposure to sudden changes of temperature while in the progress of drying. Sometimes it results if the under-coats are not dry when the finishing coat is applied. Also it is the result of a heavy varnish drying on the surface. Sometimes it is caused by applying the finishing coat before the under coats are thoroly dry.

Cracking is caused by using shellac and cheap filler, or the under-coats not having been dry when the finishing coat was applied. Sometimes it results when abnormally heavy coats have been used especially for the under-coats. Frequently it is caused by subjecting brittle varnish to too sudden changes of temperature.

Chipping or flaking is caused by varnish which is not elastic enough. It frequently occurs with rosin varnish.

Enameling is similar to blooming or fogging.

Going fatty or Livering. This trouble is caused by varnish which has been exposed to air too long in the open package.

Perishing or Crumbling. This is caused by exposure to coal gas or ammonia fumes. Frequently it is the result of rosin used in manufacturing. It may also be due to washing some varnishes with extremely hot water, strong soaps and washing compounds.

Checking is caused by applying a quick-drying coat of varnish over an elastic surface, or by building up the work too rapidly.

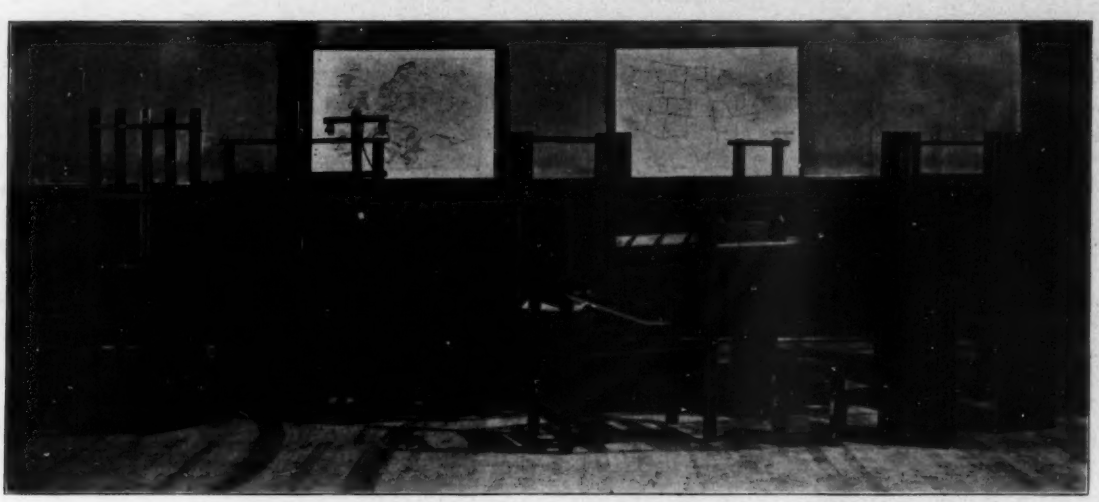
Skinning results when varnish is left in a can or bucket, standing open and exposed to the air. Remove the skin and strain the balance of the varnish thru muslin before using.

Sinking away and Deadening. This is the case when the under-coats have not been allowed sufficient time to dry, and the finishing coat becomes absorbed while in the course of hardening. Insufficient foundation coats will also cause the finishing coat to deaden. Sometimes it is caused by using varnish that is too new.

Sweating is caused by rubbing the varnish before it is thoroly hard. At first the surface will be flat and dead but in a short time it will become bright again. This is what is termed sweating.

Turning white. Brittle and inferior varnishes will turn white when exposed to hot or cold water, dampness, steam, gas, or when bruised or in other ways subjected to hard wear.

"A habit of labor in the people is as essential to the health of their minds and bodies as it is conducive to the welfare of the State."—Alexander Hamilton.



FURNITURE MADE BY PRE-VOCATIONAL CLASS, WAUKEGAN, ILL.

PRE-VOCATIONAL WORK IN WAUKEGAN

Bernhard B. Burg, Director of Industrial and Manual Training

"THERE are a great number of children in the city schools of Waukegan who need special attention," said Supt. O. S. Thompson when he first met the writer. "We cannot make them do the same work as the great majority of children. Some of them have a concrete mind and are unable to do book work; some are over-age for their grade. There are boys as old as 17 years in the sixth grade, and it is very common to find a 14-year-old pupil in grades below the sixth. Then a good number drop out long before the great body of children reach the time of graduation. We lose them mainly for two reasons: One, because the present-day curriculum does not appeal to them and, therefore, they are not interested enough to stay in school; another and very important one is the fact that in Waukegan the children are called very early in their life to make a living."

"We must run the schools for the benefit of all the children of all the people, and not expect to give out the same prescription to over two thousand children, who are as different from one another as day and night."

"I want to do something for the benefit of the unfortunate children, and do it immediately," said Mr. Thompson when he intrusted the writer with the responsibility of building up an Industrial Department in the Waukegan city schools.

We set out with great enthusiasm, with one definite and determined purpose in mind—*to give all possible help to prolong the school life of unfortunate boys and give them training that would help them to make a living after they left school.*

The Plan and the Courses.

Our school year we began with the following plan: (1) To select from the city schools boys who are totally indifferent to the regular school work, who are over-age for their particular grade; who are not able to do book-work, nor ponder over abstract problems or thinking—who do not expect to go to high school but to become wage-earners in the immediate future. (2) With the consent of the parents, to organize these boys into a special class called pre-vocational. Give them half a day shop work and a half day academic work. Correlate the shop and academic work in such a way as to make it as practical and useful as possible. Deprive the boys of nothing that will prevent them from graduating with the rest of the boys.

For this plan, the following courses were adopted:

1. *Applied mathematics.* The most essential parts of arithmetic, the fundamentals of algebra, geometry and a great number of practical problems.

2. *Business English.* Essentials of grammar, with special emphasis on sentence structure, paragraphing, composition, shop letters, business correspondence, oral discussion of current topics relative to trade.

3. *Reading.* Selected from the United States history, commercial geography, and different works treating with the practical world.

4. *Spelling.* Especially words met in daily use, and the carpentry trade.

5. *Commercial geography.* Geographic influences affecting food, clothing, shelter, raw materials and the chief sources of supply; methods of manufacture, center of manufacturing, chief routes of transportation.

6. *Industrial history and civics.* Industrial progress of the United States and European countries; primitive handwork, invention of labor saving machinery, beginnings of organization of capital and labor, relation of employer and employees, duties and responsibilities of good citizenship.

7. *Elementary science.* Great laws of nature. Cause and effect of different physical and chemical phenomena.

8. *Drawing.* A practical course in mechanical and architectural drawing with tracing and blue-printing.

9. *Carpentry.* To build a frame house.

10. *Excursions.* Visits to places, where buildings are being erected, also shops and plants in Waukegan, Chicago and other places.

Such were the courses adopted. But as soon as they were adopted, we discovered that we could not give the boys more than half of the course on account of not having an academic teacher who could teach the subjects from the viewpoint of Industrial Education. On the one hand, we did not have the money to hire an additional teacher; on the other hand, we couldn't find a suitable one in the local school system. However, the boys were sent back to their regular grade teachers for half of each day.

The Class.

Sixteen boys were selected for this industrial class, five from the sixth grade, ten from the seventh grade and one from the eighth grade. The selection was made from five schools, but 70 per cent of these boys came from the foreign district.

At first these boys gave their instructors considerable trouble. They represented the most unruly boys in the school system. A good many were very low morally. No reasoning nor corporal punishment had any desirable effect upon them. It was a noisy, turbulent group of boys. How to handle and make them work came up as a very serious question. But as soon as the boys began to take an interest in their work, the discipline to a large extent, took care of itself. Quite a help was the temporary elimination of a few individuals and the substitution of others. This the boys did not like. They wanted to stay in the industrial class, and the fear of being eliminated improved the behavior of many.

The amount of time alloted to industrial work was 650 minutes per week. Of this, 63 per cent was for carpentry and repair work, 29 per cent for mechanical and architectural drawing and eight per cent for shop mathematics.

But long before we could give our work a full swing, we were confronted with another difficulty. We needed $300 for lumber material and drawing instruments before we could do anything real. But to our great joy, in our most critical moment, the board of education came to our help and voted to give us the necessary amount of money to buy lumber material. Then the boys came out with their help and expressed their willingness to buy their own drawing instruments.

What the Class Did.

During the first three months the boys were kept on repair work, making an oak table for a stereopticon machine, making little drawers for small chairs in the primary grade, and on an experiment of mixing up concrete. They fixed the playground apparatus firmly with concrete and handed in a very good written report of the work done. They also had instruction in drawing and shop mathematics.

In architectural drawing we could give the boys only a reading knowledge of blueprints and plans of single frame houses. At the beginning of the course the boys had a test. It was very interesting how far their imagination carried them. Instead of a plan they handed in a perspective drawing showing all the interior furniture and decoration. One boy showed even a pair of socks hanging on a chair. But gradually this kind of picture drawing vanished and the boys helped to make a real plan for our real cottage.

In shop mathematics the boys had problems involving the four rules of arithmetical fractions and percentage. Here by coming in contact with practical problems such as figuring out the exact amount of lumber for a given project, the amount of wages, profit, etc., the boys began to realize more than ever the real values of arithmetic.

At this stage of our work, a new idea came to our mind. We strove to center the interests of the children of the upper grades around our cottage to be, which produced a new problem, namely: giving the children such construction work as would be strictly individual, but at the same time be only a part of one project, thus making it possible for every boy and girl to contribute toward the solution of a real practical life problem. The solution was: Let the industrial class construct a real cottage on the playgrounds; let the manual training boys of the eighth grade make all the necessary furniture in mission style; let the girls decorate the rooms, and serve visitors with samples of their own culinary efforts.

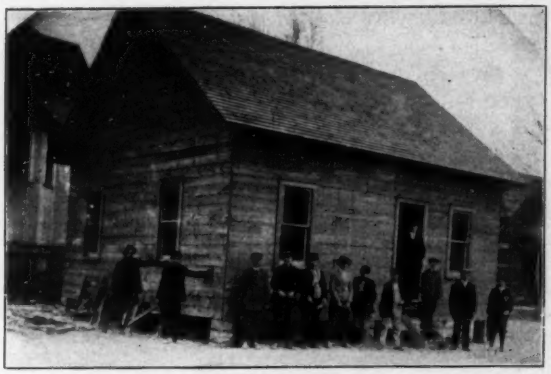
The House and Its Contents.

What was the result of the experiment?

The industrial class, composed of boys from the

The House Ready for the Roof.

The Roof Framing Complete.



The House Ready to Receive Siding.

sixth, seventh and eighth grades, laid out the grounds, erected fifteen piers of cement blocks two feet high, leveled them up, and on these built a substantial cottage 22 feet by 26 feet by 18 feet. There were four rooms, a pantry, a clothes closet and a hall on the main floor; also, a large attic which might easily be transformed into bedrooms. Each room was provided with two windows, except the kitchen, which has only one window. There was also a window in the pantry. The living and dining rooms were 9 feet by 12 feet each, the bedroom and the kitchen were 8 feet, 6 inches by 10 feet each, the hall 40 feet by 12 feet, the pantry 4 feet, 11 inches by 4 feet, and the clothes closet 3 feet, 3 inches by 4 feet. One large front porch and a smaller rear porch completed the building.

The building was completed in about 120 hours, by an average of ten boys. Of course not all of them took the same active part in the construction. A practical carpenter of considerable experience acted as the boys' foreman, and was always with them on the grounds. The boys exercised considerable self-reliance in their work referring constantly to the plans and solving disputes by consulting the plans. Neither snow nor hail hindered the boys from carrying on their work. The eighth-grade boys made mission style furniture of which 31 pieces were selected to furnish the four-room cottage.

The following is a list of the furniture placed in the various rooms:

Parlor. Morris chair, rocker, arm chair, two taborets, piano bench and pedestal.

Dining room. Table, four chairs, electric-lamp stand, telephone stand and stool, one taboret and plate-rack.

Bedroom. Library table, roman chair, book-rack, two foot-stools, chair, waste-paper basket and magazine table.

Kitchen. Table, chair and two taborets.

Hall. Hall-tree and umbrella stand.

Porch. Porch swing.

The seventh grade also contributed to the house 22 different little things made out of wood. The girls decorated the house with curtains, embroidered pillows and towels, and filled up the pantry with delicious things to eat. Flowers and pictures on the walls completed the inside decoration of the house. On the walls of the kitchen, we exhibited the drawings of the industrial and manual training boys.

Tho the house was not plastered inside, and the walls were covered only with building paper and burlap, yet it was as comfortably equipped as the average home. The children were very proud of their creation. On June 6, 1913, we opened the doors of this little house to the people of Waukegan for inspection, with an attendance of over four hundred people in the two days.

The Results of the Experiment.

Now it may be of some interest to know what became of this little home, the boys who built the cottage, and the pre-vocational course in carpentry in the city school of Waukegan in general.

The furniture, of course, was taken away by the boys who made it. The house was sold recently to a citizen of Zion City for $160. He put it on a six-wheel truck and hauled it to his five acre farm near Zion City. The material for the house cost $254.41. There is no doubt but that we could have realized from the sale the cost of the material provided a strong effort had been made to sell it in June. As it was the deficit was $94.41. But this by no means can be considered as a loss. The benefit the boys derived from the course and the educational value of the enterprise was worth much more than the entire cost of the building.

In the course of the year, 24 boys at different times attended the industrial class. Out of these, four returned to their academic work, four quit school in the early part of the year, to make a living, two were truant, and only fourteen attended the class thruout the year and ten regularly.

Out of the 24 boys who had the benefit of the industrial work, six at the present time are continuing in school in the eighth grade, two went to high school, one to business college, one became a carpenter and works with a contractor, one is working with the Chicago and Northwestern Railroad, earning $60 a month as an oiler, two are working in a grocery, one became a farm hand, one is with the Cyclone Fence Company, earning $9 per week, and attending business college in the evening; the rest are with the American Steel and Wire Company and in other small machine shops earning from $4 to $7 per week.

A good number of these boys would never have been in school had it not been for the industrial work. Three boys out of the six who are continuing their school work this year, are in school on account of the direct influence the industrial work had upon them. One of these three is a future carpenter, is quite skilled in handling tools and last summer helped a contractor in erecting a house. One of the two who went to high school entered the industrial class when he was in the seventh grade. He never thought of going to high school, but the work had such an influence upon him that he became a better student. Tho he spent half of his school time in industrial work he succeeded in being promoted to the eighth grade and moreover graduated simultaneously with the regular grade boys and entered the high school.

The boy who is working now as an oiler with the railroad is another example of what industrial training can do for a boy. This boy was the laziest of all the boys, phlegmatic and hopeless. For more than two-thirds of the year he did not do a thing. Three months in succession he was working on the same plate in the drawing room and after that period of time was just where he started. Suddenly that boy woke up, made up all his work and turned out a good student to the end of the year. He quit peddling papers and we are mighty glad to hear that he is now making $60.00 per month.

The industrial course in the city schools of Waukegan was short-lived. We had to discontinue it at the end of the first year and there is very little hope of reopening it in the immediate future. The only reason we discontinued the course was because the Carpenters' Union does not accept boys under 17 years of age, and we couldn't keep them in the grades until that age. It wasn't deemed wise to carry on pre-vocational work in the grades as long as the boys are unable to continue their pre-vocational work after leaving the eighth grade.

The local Union No. 448 of the United Brotherhood of Carpenters and Joiners of America sent us a letter May 5, 1913, in which they wrote: "Members of our organization heartily and unanimously endorse this course in the schools and we are ready and willing at all times to extend any information and assistance possible to further the cause."

Now, we shall ask ourselves the following questions: Were our efforts fruitless? Was our time wasted?—*No*, a thousand times *No*. The seeds we planted in Waukegan are beautifully growing, and they remind us of the usefulness of our work. A class of boys was materially benefitted from this pre-vocational work, tho it did live so short a time.

Our work and efforts were not wasted. We hope that this community will have in the near future a first class system of pre-vocational and vocational education so that every child and every member of this community, be he a foreign or American laborer, will have an endless opportunity to grow intellectually, morally and physically.

BASKETMAKING IN THE GRADES

Elizabeth Haberman Carter, Art Director, Mandan, North Dakota, City Schools

ONE of the most interesting problems given to the pupils in the Mandan, North Dakota, Schools is the making of Porch Baskets.

Baskets are made on round or square wooden bottoms of various sizes. The round wooden disks are three, five, six, eight, ten, and twelve inches in diameter, and cost three, six, eight, ten, and twelve cents respectively. For the square baskets a flat nosed plier is needed with which to bend the reed around the corners. The reeds used are round reed number four, and 3/16″-inch flat reed. The wooden bottoms have holes bored at equal intervals around the edge. These holes are just large enough to receive the number four reed.

The reed should be soaked in warm water one hour before using. This makes it pliable so that it may be bent to form. The reeds are cut about four inches longer than the height of the basket to be made. The points of the reeds should be dipped in glue before putting them in the holes of the bottom. After inserting the reeds, if any project thru the bottom, they can be trimmed off with a knife after the basket is woven. Having inserted

Fig. 1. Beginning Basket.

Fig. 2. Weaving in Progress.

Fig. 3. Finishing the Top.

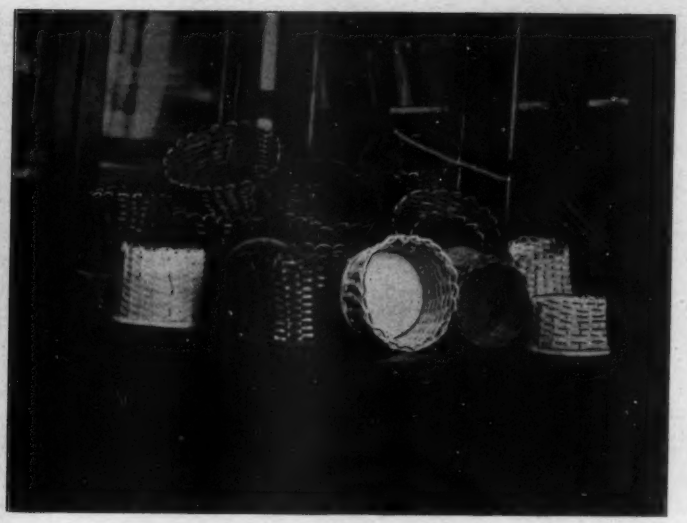


Fig. 4. Finished Products of a Day's Lesson.

the round reeds, the flat reed is tapered to a sharp point at one end, and beginning with the pointed end on the inside of the basket (and against the bottom) the flat reed is passed alternately in and out between the round reeds. The flat reeds should be shoved down as tightly as possible while weaving. The most common errors on the part of children making these baskets is in missing the alternation of the weaving and in not keeping the bands of flat reed tightly pressed together. In attaching a new flat reed, let the new one overlap the old one about two inches. Endeavor to have the loose ends on the inside of the basket. When the weaving is continued to within three or four inches of the top the round reeds are bent over and inserted into the sides of the basket alongside of the next round reed; or, it is possible to vary the pattern by inserting the bent over reed alongside the second one from itself. If a very smooth and strong rim is desired for the basket all the round reeds may be bent over at nearly right angles and bound together with raffia.

These baskets make suitable flower baskets, and a potted plant may be set in them to advantage. The baskets may be left the natural color of the reed, or they may be dyed or stained in any suitable design and color. The reeds may be dyed before they are woven, or the design may be dyed after the basket is woven. Variety may be given the pattern of the weave by weaving smaller flat reeds in double or triple bands in place of a single flat reed.

PRACTICAL SCHOOL SHOP FORGING

Thomas Googerty, Pontiac, Ill.

(Seventh Article)

Exercise No. 17—Flat Cold Chisel.

A GOOD cold chisel is an indispensable tool in a shop, and one that is very much abused. Therefore, it should be made with the greatest care. In the forging of a good chisel a piece of ⅝ inch octagonal tool steel from 75 to 95 point carbon is used. The piece is cut 6 inches long. In doing this the bar may be nicked with a chisel. The nicked part is then set over the outer edge of the anvil. A chisel with a handle is set onto the nicks and given a good blow with a sledge hammer, shearing the piece from the bar. See Figure No. 109. This method of cutting is quite dangerous so care must be taken. Perhaps a less dangerous method tho not so practical is to heat the bar red and cut the piece off with a hot chisel and sledge, or on the hardie if one has no helper. The end is then hammered. See Figure No. 110.

When cut off and hammered round on one end, the piece is caught with a fluted lip pair of tongs that will hold it firmly and a ring is placed on the ends of the reins to bind it. The end is now heated in a well burned fire, letting the heat soak in slowly, and not forcing it with too much blast. If the fire is lively hardly any blast is used on the start. The piece is brought to a heat somewhat beyond what is commonly called cherry heat. It is then taken to the anvil and drawn out square with hard blows of the hammer to a long taper, and nearly to a point. This taper should be about 1¾ inches long. See Figure No. 111.

Hammering must cease before the red heat has left the steel. It is again heated and hammered on two sides, drawing the chisel bends edgewise, do not strike it on the edge to fracture the grain of the steel. To straighten the blade, it should be hammered on the *flat*

side *near the concave edge.* See Figure No. 112. This stretches the metal and straightens the blade. Care must be taken in hammering not to make the chisel wider in one place than in another.

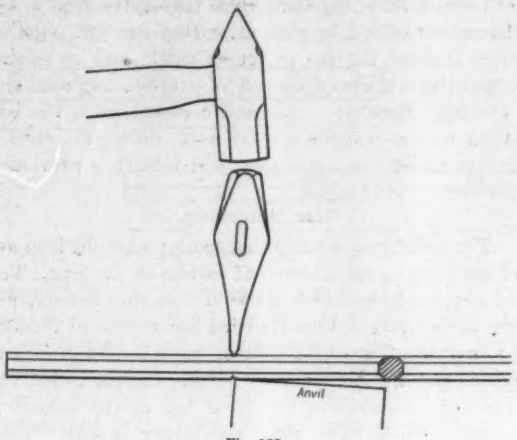


Fig. 109.

When finishing the chisel, it is hammered lightly until the red is nearly but not quite gone. This hammering packs the grain and makes it fine. The end of the chisel is set on a hardie and cut half thru, so that when it is hardened and tempered it may be broken to note its grain and also will require less grinding to

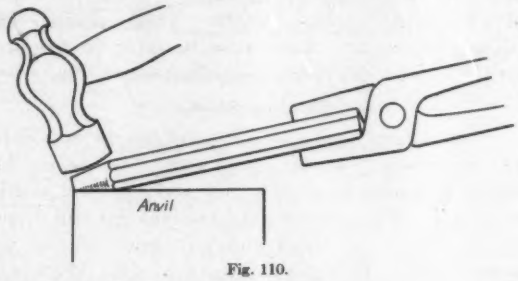


Fig. 110.

sharpen. See Figure No. 113. The chisel is now heated very slowly to a dark red and set in a dry place on the forge to anneal. This annealing relieves the strain in the tool due to hammering.

When the chisel is cold it is reheated to harden and temper. Over-heating does not make the tool harder

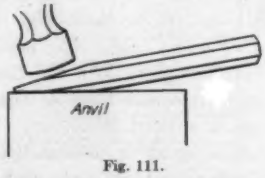


Fig. 111.

when cooled in water, but increases its brittleness, so care must be taken when heating. The heating must be very slow, and to a dark red 2½ inches long. The chisel should be cooled as the heat is going up. A common practice of heating the steel more than a cherry red and holding it out of the forge until the heat goes down, before dipping, is wrong. When properly heated the chisel is held in a vertical position and dipped about 1½ inches into 16 gallons of salt and water, heated from 60 to 70 degrees F. See Figure No. 114. The tool is kept in motion when dipped. When cooled it is removed and the hardened part rubbed bright with an emery stick or sand paper. This is done so that the temper colors may be seen. Tempering increases the tool's elasticity and strength, and reduces the brittleness. The temper color will show just a faint yellow against the edge of the remaining heat that was left in the tool after hardening.

In hardening the tool it is heated 2½ inches of its length and 1½ inches is cooled in water to harden.

Fig. 112.

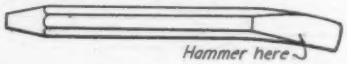


Fig. 113.

The remaining heat gradually runs thruout the whole chisel and may be noted by the faint yellow color on the bright part of the tool traveling towards the cutting end. This faint yellow temper color due to the heat and air is followed with darker colors, and if let run too much all of the hardness would be taken out of the tool. Four hundred and thirty degrees Fahrenheit would be about a light straw color, leaving the steel very hard. About 60 degrees Fahrenheit would be the darkest color, nearly black. This is as hot as steel can be made and still leave a trace of hardness. This temper is too soft for a chisel but about right for springs, therefore, when the very dark purple temper color covers the whole bright part of the chisel the point is dipped in water. The chisel is then set in a dry place on the forge to cool slowly. The temper color must run to the end of the chisel very slowly. The reason for this is that if the temper color or heat comes too fast only the point will be tempered. When the color comes slow, the chisel is tempered farther back from the point. The temper colors on the surface of the bright steel are obtained by different degrees of heat, as it travels from the remaining heat left in the tool when the piece was

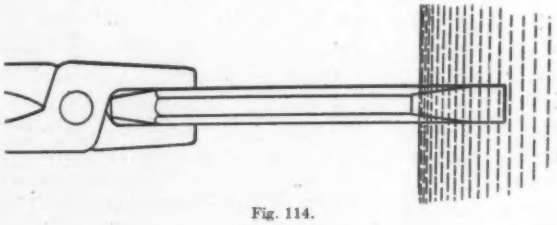


Fig. 114.

hardened. The less heat allowed to travel toward the end of chisel, the paler the temper color and the harder the chisel; therefore, the faint yellow color indicates that the steel is very hard. The darker the temper color becomes the softer the tool.

The best chisels are those that are file proof. If after hardening and tempering a chisel, it cannot be

cut with a file, it is too hard and the temper must be run out more. If the grain of steel is very fine when broken the chisel had the proper heat when quenched, but if it looks coarse the tool was too hot when cooled and must be annealed, rehardened and tempered. A little judgment will enable one to determine the proper hardness for all tools of this character by noting these temper colors. The above explanation in a general way applies to the working of all carbon steel tools.

Spring Tempering.

There are many kinds of springs that are hardened and tempered. The methods of handling are about the same with all. As an example, a piece of spring steel

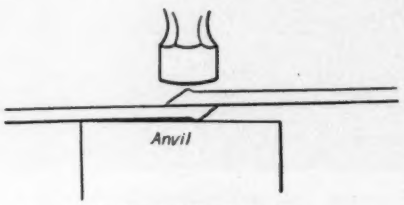


Fig. 115. Welding Thin Steel.

5″x1″x1-16″ is to be tempered. In doing this, the piece is caught at one end with a pair of light tongs. The steel is heated to a dark red and dipped into a can of sperm oil, or equal parts of lard and tallow. When cool it is held over the fire until the surplus oil takes fire and blazes off. It is redipped in the oil and the oil burned three times in all. It is then partly cooled in the oil and set on the forge until cool, when it is ready for use. Steel is manufactured especially for springs. It is called spring steel. It is made in a different way from tool steel, by the open hearth process. It differs in quality and cannot be absolutely guaranteed. The steel is never free from all foreign elements which might be detrimental to its quality.

Tempering Thin Pieces of Steel.

In hardening thin pieces of steel such as knives, very thin milling cutters, etc., there is always difficulty in preventing warping after hardening. Two heavy surface plates, planed on one side are used. On one of these plates equal parts of tallow and lard is spread ¼ inch thick. The knife is heated in a steam pipe with one end plugged and having fire under and over it. When an even red heat is reached, the knife is brought out and set on the oil and at the same time the top plate is set onto the knife until cool. This hardens the blade and keeps it from springing. The knife is brightened and the temper drawn to a dark straw color by holding it on a hot iron. Very small pieces of steel are packed into an iron pipe or box surrounded with charcoal. The whole is then heated red and the pieces are dumped out and cooled in water. To draw temper, they are put in an iron ladle filled with lard oil that is heated on the fire.

Welding Steel.

All small pieces of tool and spring steel should be welded with separate heats. A little practice and a clean fire, with some good welding compound is all that is necessary. In separate heat welding of flat steel, the flat sides of scarf are put together instead of the beveled ones. The scarfs are shown in Figure No. 115. The method of riveting and splitting small pieces of flat steel to hold them together while taking the heat is not to be recommended because after they are put together in this manner the lap is double thick, and in raising the heat there is always danger of over-heating each side of the lap. Separate heats and a clean fire is the best method to use to make a good weld, unless the steel is heavy in which case, it is split and forked as previously explained.

Case Hardening.

The difference between hardening wrought iron and tool steel lies in the absence of carbon in the iron. Tool steel can be hardened because it contains carbon, and when heated and suddenly cooled becomes hard thruout. The surface of wrought iron or mild steel can be carbonized and then made very hard. This is called *case hardening* because about 1-16 or less of the outside of the bar is made hard while the center is soft. There are several methods. One is to place the articles in a tight cast iron box surrounded with ground bone before placing in a furnace. It is then brought to a high heat of about 1700 degrees Fahrenheit. It is held at this heat for several hours and then let cool when it is reheated and dipped in salt water to harden. By another method the pieces are placed in an iron ladle with cyanide of potassium and heated. Iron may be heated red and rolled in the cyanide. Then reheated and plunged into water. Care must be taken in handling cyanide as even the fumes are poisonous.

Coloring Steel.

Very bright pieces of soft steel can be case hardened and colored at the same time. In doing this, cyanide is heated in an iron box and the steel articles put into it. When heated they are removed and dipped into a solution of water and salt peter to cool and harden them. This gives them a mottled effect with many colors. A pint of salt peter to about four gallons of water makes a solution strong enough. This bath becomes poisoned from the cyanide. It should be kept clean and labeled *"Poison."*

Annealing.

A piece of metal of any kind is said to be "annealed" when made very soft. Steel should be annealed before it is filed, drilled, or machined, as it is a very hard metal to work when cold. The method of annealing is first to heat the piece to a red heat. It is then covered with warm, slacked lime so that the air will not come in contact with it until cool. A simple way to anneal when in a hurry is to heat the steel red, setting it in a dry place on the forge until black. It is then plunged into water quickly and brought out. This operation is repeated until the piece is cool. Steel is also annealed by heating the piece red and setting it on the forge until cool. The slower steel is cooled, the softer it becomes. Wrought iron and mild steel forgings should always be annealed when used in work where there is danger of breaking them.

Exercise No. 18—Scratch-Awl.

This tool is used to scratch thru holes in the surface of metal, and also to lay out shapes on metal. Figure 116 shows the dimensions of stock which should be of carbon steel. One and one-half inches from one end, the bar is drawn out until it measures 2¼

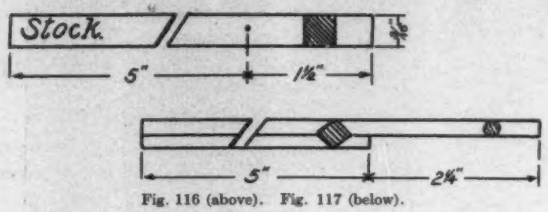


Fig. 116 (above). Fig. 117 (below).

inches in length, as shown in Figure 117. It is then bent on an angle as shown in Figure 118. This part is now heated and hammered over the horn of the anvil to form the eye or ring. It is then twisted by catching one end in the vise and twisting to the right. The point is next drawn out as shown in drawing Figure 119. The point is then ground or filed and the awl tempered hard.

Fig. 118. Scratch Awl.

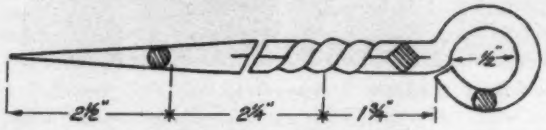


Fig. 119. Scratch Awl Complete.

Exercise No. 19—Center-Punch.

Figure 120 shows the size of stock and Figure 121 shows the center-punch completed. The top part is first made, then the bottom is drawn out to a taper. In doing this it is first drawn square, then eight sided and finally rounded. The point is ground and the punch tempered to a purple color. For heavy centering a larger size steel should be used.

Exercise No. 20—Hand-Punch.

These punches are made of various sizes of stock, 5/8", ¾" and 7/8" and are used for hot punching. Figure 122 shows the size of stock and Figure 123 shows the completed punch. It is made in the same manner as described for the center-punch. This punch must not be tempered. For punching square holes the punch is drawn square and the ends of all hand-punches are made smaller than the hole to be punched. High speed steels, due to their hardness and durability retain their edge when cutting at extremely high speeds.

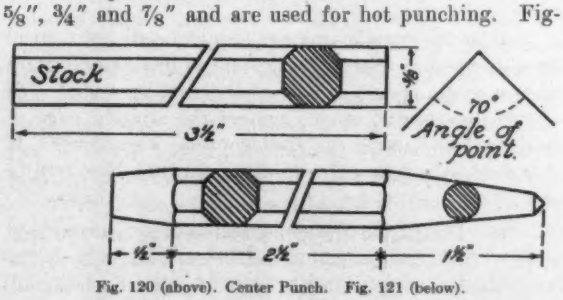


Fig. 120 (above). Center Punch. Fig. 121 (below).

It has only been of recent years that high speed steels came into use. Before this time self-hardening steels were made by Jessop and Mushet which were in general use. They were tempered by heating to a dark red and left to cool in the air. The high speed steels of today are heated to 2,000° or 2,200° Fahr., or a white heat bordering on a welding heat.

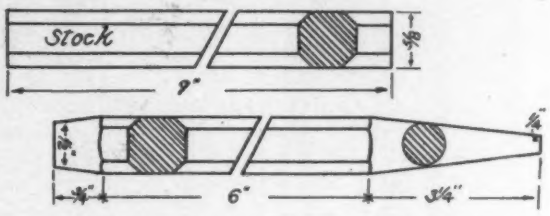


Fig. 122. Stock for Punch. Fig. 123. Completed Punch.

The chemical composition of these new steels are only known by their makers, however, it is said that they contain carbon, tungsten, chromium, manganese and other elements.

The great advantage in using high speed steel, is that a machine can be run three times as fast as one using carbon steel, without destroying the edge of the tool. The output is therefore greater. Of course, in order to force this steel to do a great amount of work the machine tools should be constructed to stand heavy strains. All kinds of tools are now being made from high speed steel.

For light lathe work, high speed steel is used in the adjustable tool holder. The most common tool for doing heavy work is the round nose which is made from various size steel.

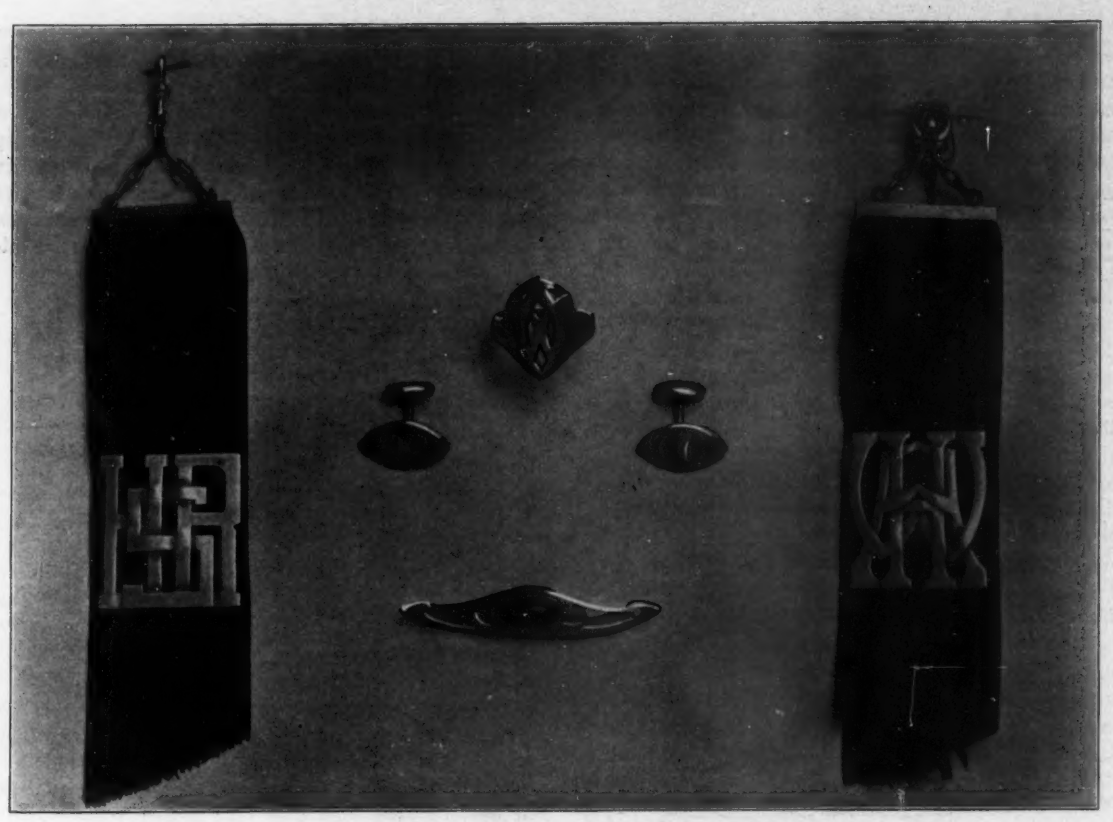
High speed tool steel is sold under many brands. The method of handling is about the same for all. However each manufacturer will give the method which is best for his particular make of steel. In forging high speed lathe tools, a furnace or clean fire with plenty of coke is used. The steel is heated to a bright red heat, holding the steel at this heat as nearly as possible when hammering. Forging at a low heat is liable to cause the steel to burst. When the tool is forged, it is laid in a dry place on the forge to cool. When hardening, the point of the tool is brought to a white welding heat, about 2,100 degrees Fahr.; this is noticeable by the appearance of melted borax, forming on the nose. The tool is now held in a compressed air blast, or dipped into sperm, linseed or lard oil until cool.

Annealing High Speed Steel.

The process is the same as the one used for carbon steel, heating to a red heat and covering the piece with slack lime until cold.

In cutting high speed tool steel, the bar may be nicked with the emery wheel, then broken.

Editors' Note. In the August Issue of the Industrial-Arts Magazine Mr. Googerty will begin a new series of articles on ART-SMITHING. The series will be a logical continuation of the articles on Practical School Shop Forging which have aroused the widest interest among teachers.



Carved Monograms, Cuff Links, Ring and Necktie Holder, Designed by Mr. Sorensen.

HAND-WROUGHT JEWELRY

H. R. Sorensen, Proprietor Orno Shop, DeKalb, Ill.

(Seventh Article)

WE are going to discuss the carving of monograms and of course, this explanation applies to any kind of carving for instance, rings, brooches and interlaced designs of all kinds.

Some very attractive effects can be obtained in the working of wrought jewelry by carving. The work of carving, chasing and engraving is really a separate line of jewelry work, but the beginner can do some very good work by a little practice and patience.

There are many men who specialize in this work and really are classed as artists as it takes good judgment and taste to execute attractive designs. Now, we feel that if a person can manipulate jewelers' tools he undoubtedly can learn to handle engravers' tools.

The first thing to do is to decide on your letters, then sketch a few arrangements of the letters as shown at Fig. 21. The straight line monogram having been selected, the transferring is done in the following manner: A piece of metal about gauge 16 is chosen. This piece of metal should be a little larger than the outline of the monogram. One edge of this metal is filed perfectly straight and it will serve as a guide when the steel tracing is performed. At this point we will make use of the dividers and try square, A and B, Fig. 22.

The dividers are set so the points are about 3/16" apart, then a line is traced on the metal using the straight edge of the metal as a guide.

The transparent paper which has the design on it should be placed on the metal so that the outside line of the R meets the line which was scratched with the dividers, then the transferring is done using the carbon paper.

After the transferring has been done all the vertical lines should be traced with the dividers using the straight edge of metal as a guide. The horizontal lines are traced by placing the try square against the straight edge of the metal and using the steel point as a scratcher. If this method is followed carefully, all of the lines will be true.

The drilling of the holes and sawing are the next steps. The sawing should be done very carefully. The lines should not be touched with the saw blade at all. The finishing up to the lines should be done with small files as in previous problems.

Before finishing the filing completely, the monogram should be dapped or bulged on the back at the points where the letters cross each other. This is done on the lead cake by using a small dapping tool C, or

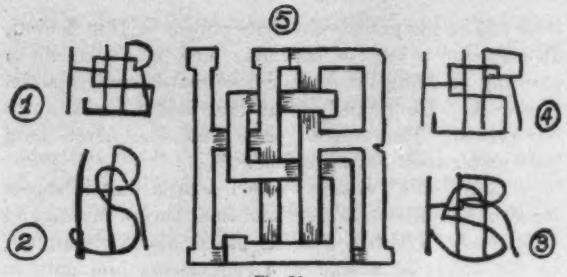


Fig. 21.

repousse tools D, Fig. 22. The interlaced effect will be much better if this is done.

The dapping of the monogram is apt to leave it out of shape, but this can be remedied by annealling the work and placing it on a smooth hard surface, right side up, and tapping it lightly with a hammer. The hammering should be done at the point where the monogram bulges out the most. Now the monogram may be filed true and up to the lines.

At this point the job is ready for carving. In order to hold the work securely it is cemented to a cement stick by slightly heating the monogram and the cement.

Cement sticks can be made very easily. They consist of a round piece of wood about 1½″ in diameter and 3″ long with chasers' cement melted on one end E, Fig. 22.

There are only two gravers needed for this kind of work, namely, a pointed or lozenge shape and a flat one, F and G, Fig. 22.

These tools can be purchased of course, but they come without handles and are not sharpened. They are not difficult to sharpen as it is done on an India oil stone by holding the tool at an angle of 45 degrees and using a forward and backward movement, F. Fig. 22.

There are many different opinions among jewelry workers as to the best way to hold the engraver's tool. We are quite safe in saying that there are very few workmen who hold their gravers in exactly the same way.

But nevertheless it is a fact that the handle of the gravers should be placed in the palm of the hand near the little finger and the thumb placed on one side of the graver. Now the thumb or the ball of the hand should be resting on the cement stick and the graver given a forward motion without moving the entire hand. No matter how hard one pushes forward there should be such control as to avoid injury to the work in case the tool should slip. Remember that the thumb should always serve as a guide for the tool, and that the graver can be moved forward for cutting without changing the position of the thumb and ball of the hand.

The pointed graver is the one to use first. It is for the purpose of cutting closely to the line of one letter which goes over the other letter. After that line has been cut the rest of the cutting is done with the flat graver. One can carve at least 1/16″ deep and about 3/16″ on the letter which goes underneath, that is 3/16″ on each side of the top letter.

It is almost impossible to do any carving without leaving traces of the graver. Therefore the marks of the graver are removed either by the use of chasing tools or fine files.

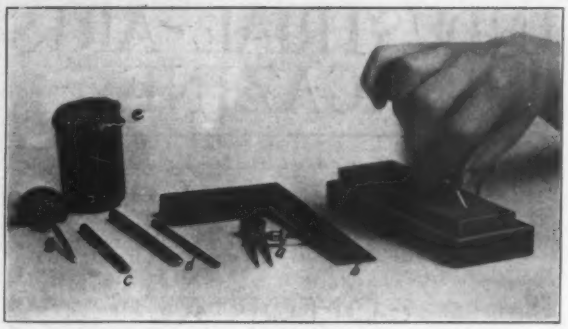


Fig. 22.

What are chasing tools? They are small tools of steel about the thickness of the handle of a needle file. The ends of these tools are variously shaped as shown in Fig. 23. If the workman comes across a place which has an unusual shape and needs finishing with the chasing tool, he very often makes his own tool.

These tools are, of course, tapped with a hammer. Great care must be exercised when doing this work or the results might be too rough.

One can buy an assortment of one hundred different tools but this is unnecessary as this kind of work requires only a few shapes, the most useful being shown in Fig. 23.

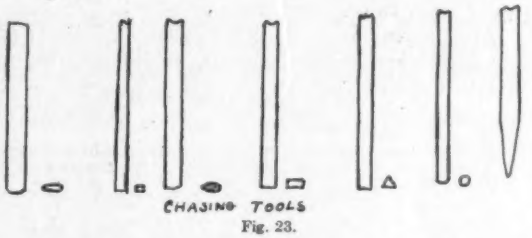


Fig. 23.

Another method of removing traces of the carving tool is by using riffle files and needle files especially the barret and flat file. Riffle files are files with the ends variously shaped for special purposes. A barret file is one that has only one cutting side, the other being smooth to prevent injury to the work. The coarse, flat needle file is a good one to use for the roughest places and should be followed by finer files until there are hardly any unsightly marks.

When the interlaced effect has been obtained, the edges of the letters should be rounded a trifle with a fine file. Then coarse emery cloth is used over the whole monogram, following this with a finer piece of emery cloth.

To remove the monogram from the cement it is heated slightly. The cement can be removed by placing the whole thing in alcohol for about fifteen minutes. When taken from the alcohol the article should be brushed lightly with a brush dipped in alcohol, to remove any cement which may still cling to it.

In order to eliminate all scratches, a polishing lathe is often used to a great advantage, but a fine emery finish is quite satisfactory. A piece of wire is soldered to the back so as to receive the ribbon. The oxidizing is done in the usual way using commercial sulphurated potash.

INDUSTRIAL-ARTS MAGAZINE

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EDITORIAL

RETARDATION.

INVESTIGATION shows that in 78 American cities, one-half of all the thirteen-year-old boys in the schools are in the sixth grade or below. Observation in any ordinary school system discloses the fact that boys overgrown and over age are crowded down with the little folks in the third, fourth, and fifth grades. The excuse is that "they didn't pass." Often they fail to "pass" only in one subject, yet they must go over the grind again all along the line, marking time in a perfunctory way to the dictation of the "system." Of course such boys are expected to appear enthusiastic about the same work over which they have already dragged once, twice, three times or more!

After a year or so of such stagnation, interest entirely disappears, disgust appears, delinquency begins, and soon the boys are referred to as sub-normal, defective, special, or by some other term expressing inferiority.

There are, of course, defectives; but neither 50% nor 1% of our thirteen-year-old boys are of this class. Experiments with such reputed sub-normal boys prove beyond question that the overwhelming majority of them are *not defective* and that sane, practical work of an occupational sort will arouse them from their state of torpidity and start them on the road again with interest revived and hopes high. *Such boys simply haven't had a chance.*

It cannot be stated with too great emphasis, once and for all, that under no conceivable conditions do thirteen-year-old boys justly belong in the third, fourth, or fifth grade of the regular public schools.

Up-to-date, progressive, and independent superintendents have the courage to admit the disgrace of such conditions, and have set themselves to the task of relieving the situation. There are cities now where boys a year or more behind grade are immediately transferred to other forms of work and to other buildings, if necessary, until they have regained their standing. When they get the habit of succeeding instead of failing, they are sent back and they make good.

In the overwhelming majority of cases when a boy falls below grade, somebody besides the boy is to blame, and the responsibility is too grave to be lightly borne. The fault must be placed and the condition remedied at any cost.

A superintendent was advised to take the retarded boys out of the grades where they were lagging behind, at least for a half of each day, and to put them to printing or doing some other constructive and interesting work. He replied, "But that would break down our system. They haven't passed and they never could pass under such an arrangement."

Think of a "system" which admits that it stands between a multitude of boys and their future success and happiness! The boy is to be pitied who finds himself in the hands of a man who can discuss him only in terms of a system. A retarded boy blundering along two or three grades behind is no more a part of the system than a grain of sand is a part of the works of a delicate watch in whose mechanism it has found temporary lodgment.

The problem of retardation is "up to" the schools. The public is soon going to demand in no uncertain measures, that they must solve it. The time is here when the schools thru wholesale and indiscriminate retardation, must cease to be the factory of intellectual hoboes who hang to the border of the educational world like the tramps who shuffle along just outside the pale of the social order.

Work must be furnished wherein every child may do his best. Systems must take on more flexibility. Standards need not be lowered—they must be broadened, so that whatever a boy's inclinations or endowments, he may find some unobstructed avenue thru the school in a reasonable time.

APPLIED VS. ABSTRACT ART.

THE general topic of the program of the Twenty-first Annual Meeting of the Western Drawing and Manual Training Association held at Milwaukee was significant. "A Casting of Accounts Educationally, of the Fine and Industrial Arts."

No division of school instruction needs such introspection more than so-called "art education." School work in the Fine Arts, and schoolwork in the Industrial Arts continue to stand apart. The subject of the program suggests this by its wording. No clear distinction can be made between Fine and Industrial Art in common school teaching. The most enthusiastic art teachers concede that it is not the function of the common schools to prepare specifically for the fine art professions of painting, sculpture, architecture, poetry, music or the drama. Even the colleges assert their inability to do this at present, and the preparation for these professions is left largely to schools with little or no academic requirement. The result is evident in our general low standard of professional fine art which of necessity requires the greatest mental development, and receives the least.

The industrial teachers of the public schools concede that industry and mechanical skill without art are inadequate. This concession is evident in the affiliation of the industrial and art interests in the associations of teachers. At present the guiding principles of art, and their application, are not understood by all teachers of art or industry, with the result that much of the teaching is aimless. Common school work in art is

often no better in execution or conception in the higher grades than the lower. Industrial work is often conducted with no consideration of appearances.

The problem of formulating school work in the industrial arts, to give proper balance between art and industrial needs is, therefore, a vital one. One point of contact between these needs was persistently made evident at the Milwaukee meeting. *Art effort in the public schools should be applied rather than abstract.*

KEEP THEM BLIND.

RECENTLY a prominent advocate of industrial education and vocational guidance was asked, "What have you to offer the seven millions of common laborers? What shall we do for them?" The reply was "Keep them blind."

This advice is as old as civilization's struggles. Thruout all history, the fight for real democracy and universal education has always encountered forces whose slogan was "Keep them blind." This has been the cry from Esau to Huerta.

When four million human beings wore shackles on American soil, a mighty host of men marched forth with the battle cry, "Keep them blind," but the forces of civilization, justice and universal education joined hands and the shackles fell and the eyes of the blind were opened.

Above the din of confusion in Colorado at the present time can be heard the persistent note, "Keep them blind."

No, in *America* we cannot stand behind such doctrine. We suggest the substitution of another familiar injunction, "Help the blind." Universal education and democracy are dangerous propositions from certain points of view, but from other standpoints they are the means by which the race must reach its greatest achievements.

We have but little credence and no respect for the "bliss of ignorance." The forces of education and progress must never be content until the last and least of the common laborers shall have been made capable of living the genuinely conscious life and shall have had such training, opportunity and guidance as shall ever hold out the beacon of hope and shall remove many of the awful handicaps to the strife for better things.

EVENING SCHOOL LEGISLATION.

Some one has well said that we should never attempt to abolish any practice or institution until we have supplied a better one. Some recent legislation has prevented young people from attending evening schools but fails to provide anything better. As an example, the Indiana Vocational Education law provides that attendance upon evening classes *shall be* restricted to persons over 17 years of age. The law states that school authorities *may* establish day continuation schools for young persons under 17 years of age.

We do not contend that the evening school is the ideal place for a young person who has worked all day, but it is far better than a pool room or a cheap theater. The evening spent in night school is preferable to the one spent in loafing in places of questionable amusement.

In the report of the Lane Technical Evening School in our last issue, the statement is made that 1,332 students were under 18 years of age. We fail to see where closing the night school to these young persons would be beneficial in any way.

WASTE IN TEACHING.

IF we could eliminate the element of waste from teaching, what a difference it would make in educational results! The teacher in the shop probably faces the most serious problems along this line, altho much of such waste is often due to agencies over which, unfortunately, he has no control.

It would be well for all of us to ask ourselves how much of the pupil's time is actually wasted. Does he get to his work on time and spend his time uninterruptedly on his work, or must he wait indefinitely for material, instruction, supplies, etc.?

Do we waste the time of the class by lack of preparation in matters of proper material properly prepared and arranged? Do we often make it necessary for a number of pupils to remain idle for a large part of the class time by reason of our attention to supplying the needs of a few individuals?

Would it be unfair to charge teachers of manual training with permitting much loss of time by reason of dull or improperly sharpened tools? Whether or not this charge should stand as a general indictment against us, it is certainly true of many of us:

While it is true on the one hand that there is considerable waste in the matter of materials, on the other hand, it is also true that oftentimes the penuriousness of boards or superintendents has resulted in the grossest waste. It is not uncommon to hear teachers say that they have but the most meagre supply of materials and those of the poorest sort. What a waste of time, what loss of interest, what a discouragement!

Report has it that some teachers waste the time of the pupil and exhaust his patience and his interest by interminable discourses on various topics. Similarly, it is complained that some of us are liable to the weakness of giving so many directions at one time as to confuse the ordinary pupil and thus make it necessary to give much of the instruction again.

There are many conditions which render the elimination of waste a difficult task. However, it should be the aim of every teacher to be a genuine and wise conservator of time, energy, and materials, and to use them all in such a manner as to bring the greatest results.

BATON ROUGE, LOUISIANA, during the present school term, has taken steps toward advanced methods in education by the introduction of a Mechanic Arts Course and a Domestic Science Course. These departments have seven rooms at their disposal located on the ground floor of the new high school building.

THE LANE TECHNICAL SCHOOL NEWS is a newspaper edited, printed and published by the students of the Evening School held at the Lane Technical High School of Chicago. This adds considerable interest to the work of the evening school classes.

BRIEF ITEMS OF INTEREST

AMERICAN FEDERATION OF ARTS.

THE FIFTH ANNUAL CONVENTION of the American Federation of Arts met in Chicago, Illinois, May 21st, 22nd, and 23rd. The meetings were held in Fullerton Memorial Hall, in the Art Institute Building. Robert W. DeForest presided as President of the Federation. Honorable Carter H. Harrison, Mayor of the City of Chicago, welcomed the Federation to the city in a brief address, in which he emphasized that Chicago was not exclusively materialistic as charged, but that in its short life and extremely rapid growth had found opportunity to develop institutions of esthetical study, and museums containing notable collections. The President of the Federation in response emphasized the World's Fair of 1893 as the greatest impetus to artistic development in the United States.

After the report of the Secretary, Miss Lelia Mechlin, which showed a flourishing condition of the Society as regards its membership and operations, the report of the Treasurer, N. H. Carpenter, stated the organization to be in excellent financial standing. The Federation now has an enrollment of over two hundred chapters representing art interests in 35 states of the Union. Delegates from a majority of these chapters were in attendance at the convention. Dr. Edward Robinson, Director of the Metropolitan Museum of Art, who was to have addressed the Federation at its first meeting, was absent on account of illness, and in his place Frank Crowninshield, Art Editor of the Century Magazine, gave an impromptu address on the experiences of an Art Editor. This address was full of interesting reminiscences and valuable suggestions to the artist with regard to methods of work suitable to reproduction.

In the afternoon session of Thursday, May 21st, R. Clipston Sturgis, President of the American Institute of Architects, presented the subject of Municipal Parks and Playgrounds. Mr. Sturgis emphasized the need of directing the interests of city children toward agriculture and nature study thru the establishment of play grounds, and gardens in the waste places of American cities. Mr. Sturgis presented a series of illustrations of English country houses and grounds showing the development of gardens and playgrounds within limited spaces by the country citizens of England. Maurice I. Flagg, Director of the Minnesota State Art Society, explained the work this society is doing in the development of art industries among the foreign settlers of Minnesota. Mr. Flagg also illustrated the development of model farmhouses, which are urged by the society upon the farmers of Minnesota as a step in the direction of bettering farm conditions. The discussion which followed led to considerable criticism of the Minnesota plan, but it was in general favored as a desirable effort which should be followed by other states. Wm. Sloane Coffin, Director of W. & J. Sloane. of New York City, and founder of the Art in Trades Club, gave an interesting and spirited address on Art in Trades. Mr. Coffin asserted that salesmen in our stores have more opportunity of influencing taste than all of the art teachers of the country. This interesting statement was given in support of the assertion that our tradesmen must be trained in esthetical judgment. The Art in Trades Club of New York is promoting this work in the city of New York thru classes held in the West Side Y. M. C. A., under the direction of an executive committee, and under instruction by Frank A. Parsons, President of the New York school of Fine and Applied Arts. Mr. Parsons, as conductor of these courses during the last nine years, has won the endorsement of more than seven hundred practical men in the art trades, who have enrolled in his classes. Mr. Coffin asserted that classes for the instruction of trades people should be promoted by persons other than their employers.

In the morning session of Friday, May 22nd, Charles Moore, member of the National Commission of Fine Arts, presented the subject of the selection of Artists to execute public works. Mr. Moore cited from his own experience as a member of the National Art Commission, experiences tending to show that the best results are attained by direct selection of good men to design public monuments rather than to submit the design to competition between professionals. It was pointed out that the best professionals do not enter competitions, and that excepting for the opportunity given to obscure artists, the competitive method has no advantages. It was also shown that considerable waste occurs in the conducting of a competition thru the giving of various prizes and thru the fact that many men are employed in the preparation of drawings that are not used. It was advised that Committees of laymen should secure a competent advisor in the profession related to the project, before selecting an individual to prepare designs. The constant objection to the plan of selecting a competent individual to design public works comes from the misguided public opinion that competition is the fairest. Mr. Thomas, Chairman of the Boston City Art Commission, stated the experiences of the Art Commission of Boston, and emphasized the difficulties which the Commission has in exercising its function without adequate authority. In conclusion he advised that city departments have an established agreement for a general plan of city decoration and that this agreement be held binding on the city at large. He further advised that in this scheme allowance be made for the continual disposition of statues and various monuments that must of necessity be presented to cities and which are commonly misplaced and unsightly.

In an address on Western Art Commissions, Lorado Taft, Secretary of the Municipal Art Commission of Chicago, pointed to a difference between Eastern and Western Commissions in that the Western Commissions proposed and promoted artistic improvement whereas Eastern Commissions were primarily censors of improvements proposed by others. The discussion which followed Mr. Taft's address showed that the Chicago Art Commission had slight authority in the matter of public works, and had passed upon comparatively few such works during the past year; whereas the Art Commission of New York had been given authority to pass upon all construction placed on city property, excepting such as might be allowed to pass uncensored by the Commission thru the special action of the Council and Mayor. The New York Commission has passed upon over three hundred submissions during the past year, and a view of some of these constructions submitted to the Commission showed most remarkable improvement over some constructions which had preceded the appointment of the present Commission. The Bulletin concerning present laws governing Art Commissions may be secured by application to John Quincy Adams, Secretary of the Art Commission of the City of New York.

In the evening session of Friday, May 22nd, Lelia Mechlin, Secretary of the American Federation of Arts, addressed the Federation upon the subject "Why the American Federation of Arts was Formed." Charles L. Hutchinson, President of the Art Institute of Chicago, gave the history of the American Federation of Arts. Robert W. DeForest addressed the Federation on the Scope of the American Federation of Arts.

The morning session of Saturday, May 23rd, was devoted to the report of special committees, and the election of directors. An address on the Influence of World's Fairs on the Development of Art was presented by Charles Francis Brown who represented John E. D. Trask, Director of Fine Arts, at the Panama-Pacific Exposition.

Mr. Trask assented that the great World's Fairs have promoted art interests and interest in art, more than any other influence of modern times.

At the suggestion of Cass Gilbert who has just returned from the west, resolutions of protest were made by the Federation against the commercialization of the beautiful Yosemite Valley and measures were taken by the Federation toward the permanent retention of the natural scenic beauty of the valley.

WORCESTER TRADE SCHOOL CONFERENCE.

A CONFERENCE of Trade School workers was held in Worcester, Mass., May 21-23. Something over 200 people representing in addition to those from the local trade schools the following other cities and schools were present: Beverly, Lowell, New Bedford, Somerville, Boston, Wentworth Institute, Newton, Springfield, Northampton, Westfield, General Electric Co. of Lynn, Schenectady, Waltham, Marlboro, Williamson School, Pratt Institute, New Britain and New Haven, Conn., and Teachers College, Columbia, North Bennett St. School, and the Woman's Educational & Industrial Union, Boston.

The principal subjects discussed were the teaching of the money value of time, cultural values in classroom related to shop work, the relative positions of the Technical High School and the Trade School, the essential qualifications for teachers and their training, requirements for admission to trade schools and requirements for graduation and admission to the industries.

Friday morning the guests were shown over the two schools which were in operation and then taken in automobiles to visit the various industrial plants in the city. In the evening a dinner was held at the Bancroft at which addresses were given by Mrs. Eva White, agent of the State Board of Education having charge of the work of the Girls' School, Mrs. Milton P. Higgins, James P. Monroe of the National Society for the Promotion of Industrial Education and James Logan who was, as Mayor of Worcester, largely instrumental in starting industrial education in the city.

Some of the points which were brought out in the discussion which was very informal, were as follows: There appeared to be a strong feeling that the cultural side of things especially so far as it relates to morals and civics had a necessary place in trade school work, but it also appeared that it could be brought in without interfering with the effective learning of a trade, and that it could be emphasized in connection with both classroom and shop work by having the right kind of teachers to whom the pupils could look up rather than down. It appeared to be generally felt that shop men made the best teachers but that they needed careful selection to get men as well as workmen, and that they also needed training in mathematics, science, etc., as well as in the mechanics of teaching.

Mr. Robert O. Small, Deputy Commissioner of Education for Massachusetts, expressed the view, which was afterward confirmed by Commissioner David Snedden, that the place of the purely Technical High School is that of a training place for boys who can spare the time to spend four years in acquiring adaptability in the hopes that it might lead them more directly into places of responsibility than either the usual English or Classical high school course, or the course of the Trade School. He expressed the opinion that there was little call for any school intermediate between the trade school and the Technical School of College grade.

The most interesting discussion in many ways was that over admission qualifications to trade schools. Here again Dr. Snedden made a strong plea for the trying out of every child that wished to enter any industry regardless of the grade in school which he might have attained. He, however, qualified this by saying that those who proved themselves unfit should be dropped from the schools as soon as possible. The teachers who are on the firing line, however, were for the most part anxious to find some tests, not necessarily academic, by which the raw recruits could be to some extent sorted out before they were allowed to clog the wheels of the schools at all. It was pretty well agreed that children from grades below the seventh were not likely to make good, but that for the most part these backward children were and had been habitual absentees either thru illness, connivance with their parents or just plain truancy.

E. H. Fish.

AGRICULTURAL EXTENSION LAW IN EFFECT.

THE Secretary of Agriculture has written to the Governors of all the States asking that they designate the college or colleges to which the funds provided by the Smith-Lever co-operative agricultural extension law are to go. This is the first step in putting into effect this Act approved by the President May 8, which provides for the granting of Federal funds to the State Agricultural colleges to aid in diffusing among the people useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same.

The conditions of the Act are that each State must duplicate the money above $10,000 a year appropriated to it by the Federal Government. The money raised by the State may come from the State, county, college, local authority, or individual contributions from within the State, for the maintenance of co-operative agricultural extension work. The Governor of each State, in the interval until the Legislature meets, is called upon to designate the agricultural college or colleges to which the Federal funds are to be paid.

The Act provides that each State in which an agricultural college is designated shall receive as a basic fund from the Federal Government $10,000 annually without additional appropriation from the State. The Act then makes the provision for additional appropriations to be distributed in the proportion which the rural population of each State bears to the total rural population of all the States, as determined by the next preceding Census. To share in these additional funds, however, the State, either thru State, county, college, or local funds, or from individual contributions from within the State, must duplicate the additional amounts granted by the Federal Government for the maintenance of the co-operative agricultural extension work provided for in this Act.

The additional appropriations provided for in the Act are as follows: $600,000 for the fiscal year following that in which the basic appropriation first becomes available. This $600,000 will then be increased by $500,000 for each succeeding year thereafter for seven years until the total additional sum appropriated is $4,100,000 annually. This sum and the annual basic appropriation of $480,000 will then be available each year thereafter.

The Act, after providing that pending the inauguration of the new work the farm management and farmers' co-operative demonstration work shall not be discontinued, defines the uses to which the Federal moneys shall be put as follows:

"That co-operative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects thru field demonstrations, publications, and otherwise; and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State agricultural college or colleges receiving the benefits of this Act."

The Act provides that no appropriation of Federal money shall be applied directly or indirectly to the purchase, erection, preservation, or repair of any building or buildings, or the purchase or rental of land, or in college-course teaching, lectures in colleges, promoting agricultural trains, or any other purpose not specified in this Act.

Not more than five per cent of each annual appropriation may be applied to the printing and distribution of publications, which means that ninety-five per cent of the appropriation must be devoted to the giving of instruction and practical demonstrations to persons not attending the colleges.

The Act also provides that where any of the Federal money so granted to a State shall be diminished or lost or be misapplied, the State, until it so replaces the money, cannot receive further Federal appropriations.

VOCATIONAL EDUCATION IN INDIANA.

INDIANA'S Vocational Education Law has been pronounced the most comprehensive statute yet enacted, dealing with the subject of industrial education. The results of the practical application of the law will therefore be watched with considerable interest.

Bulletin No. 6 of the Vocational Series issued by the State Department of Education gives to superintendents and school boards, contemplating the establishment of such vocational schools, the help needed to enable them to organize and conduct the vocational work in accordance with the standards and principles approved by the State Board of Education.

The following quotations from the bulletin give the principal points which are emphasized:

Vocational education as provided for in the Indiana Law may, therefore, for the sake of clearness, be defined as that form of education whose controlling purpose is to fit for useful and efficient service in the shop, in the home and on the farm, given only to persons who have already indicated their intention to enter such employment, or who are already engaged therein, and who wish to increase their efficiency in their chosen occupation.

The practical arts work is given in the regular schools, while the pupil continues his general education. The vocational work is given in a special school, where chief emphasis is laid on the preparation for a particular occupation. Even tho the practical arts work in the regular schools should be conducted according to the latest and most approved commercial, farm or shop methods, so that pupils in these courses would be getting real typical experiences in these fields of work, as we hope may be the case, the work would still not be vocational because the vocational motive—"preparation for profitable employment in a particular occupation or field of work"—is lacking. Vocational education, which has for its controlling purpose the training of a boy or girl for a particular occupation, should not be undertaken in the regular school course, but should be given in a department or school created for that special purpose as our law provides.

It may readily be seen from the above definitions and distinctions, that the vocational work for which state aid has been provided does not give us a complete solution of the vocational education problem in Indiana. We have merely selected a particular problem or field of vocational work upon which to begin. Of the following possible forms of vocational education (1) Agricultural, (2) Industrial, (3) Household arts, (4) Commercial, (5) Professional, (6) Higher technical, (7) Marine or nautical, state aid has been provided only for the first three kinds. Moreover, we have selected but a particular problem in the field of work taken up, namely: To provide vocational education for that large group of boys and girls who must go to work or begin to prepare specifically for a wage earning occupation, at 14 years of age, and to provide in Part-time and Evening classes, vocational instruction for those who have been obliged to go to work at an early age without specific training for the occupations in which they are engaged.

Our immediate task is to carry on the work mapped out by the present law. When this work is well under way we may with safety and profit extend the work to other fields of vocational education as rapidly as possible. In this important undertaking the co-operation and persistent endeavor of all business and laboring men, more particularly the school people of the state, is *absolutely* necessary to make the vocational work a success.

d. Types of Part-time Classes Not Eligible for State Aid.

It will readily be seen that a part-time class which seeks primarily to extend general educational facilities to young workers for the purpose of increasing their fund of general information or which aims to give to workers vocational training designed to fit them for another higher or more remunerative occupation or trade does not fall within the scope or intent of part-time classes as defined by our law. To receive state aid for part-time work the school must give instruction in the present wage earning occupations of the pupils, instruction designed to make them more efficient and productive workmen in that occupation or trade. Schools which aim to advance the general intelligence of workers are highly desirable and are commended to local communities by the state board. It is also important to provide a means whereby the workers who have gotten into "blind-alley" jobs, may be able to fit themselves for more skilled occupations, but a school having this for its aim cannot be state aided under the law. Only a few definite things could be taken up and encouraged by our law. It was evidently believed more important to begin by assisting the workers along the lines of their present employment than to try to help them get into another occupation, or endeavor to continue their general education in which they had already lost interest. It should also be noted that the most careful students of vocational education believe that a new occupation cannot be successfully taught in a part-time or evening class because of lack of time. All these facts emphasize the importance of effective educational guidance in our public schools.

b. Types of Evening School Work That Can Not Be State Aided.

The following types of evening school work cannot be state aided under the law: (1) *The general evening school* which seeks to continue the general education of industrial and other wage earners by general or special courses of instruction. Such schools play a very important role in the school system of a city or state and should be encouraged, but the controlling purpose of an evening class in a state aided vocational school must be "to fit the worker for more profitable employment in the occupation in which he is actually engaged." (2) An evening school which provides instruction for wage earners, designed to teach them another more remunerative occupation or trade or one permitting of a higher degree of skill is not eligible for state aid. There can be no question as to the value of a school which seeks thus to benefit the individuals engaged in unskilled occupations, and who are beyond the reach of our regular schools. Such work merits a more extensive introduction thruout the state, but under our vocational education law such classes cannot be given state aid. (3) There is another type of evening school which seeks to improve a workers' trade efficiency while at the same time continuing his general education. Such a school would not be eligible to share in the state allotments, since the controlling purpose of all state aided vocational classes or schools must be to fit for profitable employment. All evening vocational classes must give instruction which will actually add to the stock in trade of a wage earner who has already entered upon the skilled calling he expects to follow as his life work. A practical farmer would not be eligible to enter a class in plumbing or a plumber a class in poultry raising or market gardening in a state aided vocational evening class.

2. How to Start Vocational Work in a Given Community.

a. The Preliminary Survey.

The first step in the establishment of a vocational department or school is to make a preliminary investigation to determine:

1. If there is a well defined need for a vocational department or school in that community.

2. For what industries or occupations the proposed department or school should prepare.

This may be done (1) by ascertaining what has become of the boys and girls who left school at fourteen years of age and determining which forms of vocational education, industrial, agricultural or household arts, would best meet their needs. (2) By listing the predominant industries of the community and ascertaining whether or not these offer opportunities for skilled employment and proper inducements for a permanent occupation. (3) By ascertaining the facilities already available for giving vocational instruction in the occupations and industries represented in the community.

3. It should next be determined to what extent the employers will co-operate with the local school authorities in providing the vocational training most needed in that community.
4. It must finally be determined whether an all-day school, part-time or evening classes will best meet the needs of this particular community.

Such a preliminary investigation should be carried on by the local school authorities or by a committee appointed by them (Board of Trade, Chamber of Commerce, Civic Club, Central Labor Union), working in co-operation with the state board of education. The department of public instruction will render whatever assistance it can to any committee making such an investigation and may, in some instances, make the investigation, if requested by the local authorities to do so.

A plan that has proven very successful in arousing interest in the vocational work is to appoint a local commission on vocational education to study the problem and co-operate with the state department in making such investigation. Such local commission might well consist of employers and employes representing the industries of the locality, of women of experience in social and industrial activities, representatives of local civic and social organizations, and members of boards of education, and might be continued as a permanent development committee for vocational education in that community. Such a *commission* should, however, not be confused with the advisory committee to be appointed for each vocational school described below.

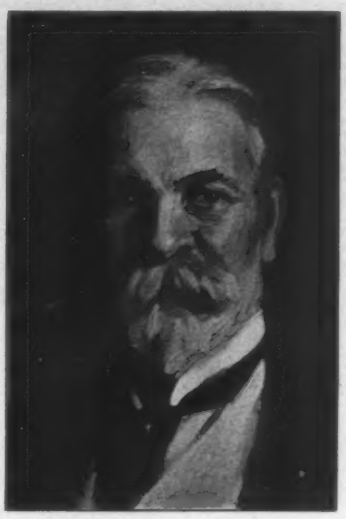
After this preliminary investigation has been made, and if it should be shown that there is sufficient need for a vocational department or school, the following additional steps must be taken:

1. The selection of a director or head for the vocational work.
2. The appointment of an advisory committee for the school, representing the local trades, industries and occupations for which the school or department is to prepare.
3. The arrangement of a course of study.
4. The securing of a building suitable to meet the needs of the school and equipping it with the necessary machinery and furniture.
5. The employment of properly qualified teachers to give the necessary instruction.

DEATH OF MR. FRENCH.

One of America's most distinguished art authorities has been removed thru the death of William M. R. French, who passed away at St. Luke's Hospital, Chicago, on June 3. The Art Institute of Chicago which owes its inception and its present wide influence for art education and popular appreciation of art to its late Director, was very fittingly the scene of the funeral on June 5.

William Merchant Richardson French, son of Henry Flagg and Anne Richardson French, was born at Exeter, N. H., October 1, 1843. He was prepared for college in the local schools and Phillips Exeter Academy, and entered Harvard College, November, 1860, and graduated in 1864. He served in the Civil War in a Massachusetts regiment until illness compelled his retirement, and then took up



W. M. R. FRENCH
Died June 3, 1914.

engineering and landscape gardening. After a number of years Mr. French settled in Chicago. About 1872 his numerous professional writings for journals and societies became sought after, but in 1874 he began to yield to his natural proclivities for art pursuits, to write reviews and deliver lectures. In 1878 he became Secretary and Manager of the Chicago Academy of Design which in 1879 was reorganized in pursuance of his efforts under the name of the Art Institute of Chicago. Mr. French received the title of "Director" which he has retained for the last thirty-five years. The development of the art museum and the art school has been his absorbing occupation, and the finely installed collections of the museum and the great school of drawing are a monument to his directorship.

Besides the care of the school and museum Mr. French delivered lectures upon art topics in all parts of the country, wrote articles for publication, and traveled extensively in Europe.

Mr. French married in 1879, Sarah M. Lovejoy, who died two years later, leaving no children. He married a second time, March 28, 1890, Alice Helm. A son, Henry H., was born August 4, 1891, and a son Prentiss, was born June 26, 1894. His widow and both sons survive him. His brother, Daniel C. French, the well-known sculptor, was with him at the time of his death.

Mr. French was one of the founders and a charter member of the American Association of Museums, a member of the Union League Club, charter member and officer of the Chicago Literary Club, and of the Cliff Dwellers Club, and President of the Central Howard Association.

Several years ago he was decorated by the French Government with the order of "Officier d'Academie."

ALABAMA WINS BOYS' CORN CLUB CONTEST.

The Alabama corn clubs have won the trophy offered by business men of Louisville, Ky., for the team of ten boys in any Southern State who could show the best records in corn growing at the Conference for Education in the South on April 10. The trophy is a medallion bust of the late Dr. Seaman A. Knapp, the founder of the farm demonstration work. Each member of the team is also to receive a miniature of the medallion in the form of a watch charm.

Ten Alabama boys produced 1,718.3 bushels of corn on ten acres, at an average cost of $0.182 cents per bushel, or $31.73 per acre. The average profit was $140.14. This means that a profit of $1,401.40 was made on 10 acres, estimating the corn at $1 per bushel. As a matter of fact, much of the corn has been sold for seed at $2 to $3 per bushel.

The business men of Louisville also offered a trophy for the best record of canning club work done by a team of ten girls from any Southern State. The trophy consisted of a silver medallion bust of the late Dr. Seaman A. Knapp and ten silver pendants, each containing a smaller reproduction of the medallion to be presented to each of the girls in the prize team. Exhibits and records were shown from each of the fifteen Southern States. Ten canning club girls of Mississippi won the girls' trophy for their State. They produced 27,850 pounds of tomatoes from their gardens of a tenth of an acre each. From these plots these ten girls canned 29,379 No. 2 cans of tomatoes and other vegetables. The value of these products, including the vegetables used at home, was $1,179.92, and the total profit, $868.66. The average cost of gardening and canning per tenth acre was $29.93.

The finest individual record in tomato growing in the United States in 1913 was made by Miss Clyde Sullivan, a 14-year-old canning club member of Ousley, Ga., who produced 5,354 pounds of tomatoes on a tenth acre and canned 2,254 No. 2 cans, 212 No. 3 cans, and made 60 pints of catsup. The entire receipts from this tenth acre were $229.26 and the profit $132.39.

NATIONAL AID TO VOCATIONAL EDUCATION.

The National Commission on Vocational Education, appointed last winter by President Wilson, made its report on June first, and introduced in the Senate and the House of Representatives a bill providing for National aid to the respective state systems offering vocational studies. While the report of the Commission is not available at the present writing, the bill introduced in the Senate gives an exact idea of its findings.

The proposed law, if passed, will duplicate the expenditures of states for the salaries of teachers and supervisors of agricultural subjects and of teachers of trade and industrial subjects and in the preparation of teachers of these subjects and of home economics. In addition, a sum will be provided for a Federal Board of Vocational Education, which will be intrusted with the administration of the act and with the further duty of making studies and reports to aid in the further promotion of Vocational Education.

The bill carries appropriations beginning with a minimum of $500,000 for agricultural teaching for the year June, 1915-16, and increasing annually by one-half million until 1924, when a total of three million dollars is reached. Sums alloted to the states will be in proportion to their rural population and the total rural population in the United States.

Similar appropriations are made for the payment of salaries of teachers of trade and industrial subjects, the amount appropriated in 1916 to be $500,000 and to rise in half-million steps up to $3,000,000. The sums alloted to the states will similarly be in the proportion which their urban population bears to the urban population of the United States. Like sums will, also, be appropriated for the preparation of teachers, supervisors and directors.

States which will seek to share in the benefits of the act will be required to designate or create a State Board of Vocational Education to consist of three members. The regular State Board of Education or other body having charge of the administration of the state system or of the vocational education system, may be designated. A Federal Board for Vocational Education, consisting of the postmaster general, the secretaries of the interior, agriculture, commerce and labor, is to be created as mentioned above. It will co-operate with the Departments of Agriculture and Commerce in making studies and investigations concerning the teaching and administration of vocational subjects. Its executive officer will be the Commissioner of Education and he will be given such assistants as may be necessary. A sum of $200,000 is to be available annually for investigations and reports, salaries, etc.

States which intend to come under the law will be required to prepare plans showing the kinds of vocational education proposed, the kinds of schools and equipment, methods of instruction, etc., etc., and submit the same to the Federal Board for approval. Annual reports will be required of the work accomplished and of the receipts and expenditures of moneys under the provisions of the law. It is specifically provided in the bill that no federal money shall be used for anything except the payment of teachers' salaries and that every dollar so expended shall be duplicated by the several states for the supplementary cost of instruction so that the systems of instruction may be well rounded.

Exhibit of the Manual Arts and Drawing Departments of the Wicomico County High School, Salisbury, Md.
Mr. A. L. Greenwood, Instructor.

It is provided further that in order to receive the benefits of such appropriations, the states shall plan that the agricultural education shall be such that its "controlling purpose" shall be to fit for useful employment, shall be less than college grade and designed to meet the needs of persons over 14 years of age who have entered upon, or who are preparing to enter upon the work of the farm or of the farm home. The amount expended by a community for the maintenance of such education shall not be less annually than the amount fixed by the state board with the approval of the federal board, shall include at least six months of supervised practice in agriculture on a farm and shall be in charge of teachers having at least the minimum qualifications fixed by the state.

Similar provisions are made for trade and industrial education in the cities. The bill provides that the industrial schools shall have as their "controlling purpose" the fitting for useful employment, that the education shall be less than college grade and shall be designed to meet the needs of persons over 14 years of age who are preparing for a trade or industrial pursuit. The state or the local community shall provide the necessary plant and equipment as determined by the state with the approval of the federal board. The instruction offered shall extend over not less than nine months per year and not less than thirty hours per week and at least one-third of the sum appropriated by any state shall be applied to part-time schools or classes for young workers over 14 who have entered upon employment. The subjects offered in a part-time school may mean any subject given to enlarge the civic or vocational intelligence of such workers over 14 and less than 18 years of age. Such part-time schools or classes shall provide not less than 144 hours of classroom instruction per year. Evening industrial schools shall fix the age of 16 years as the minimum entrance requirement and "shall confine instruction to that which is supplementary to the daily employment." Cities and towns of less than 25,000 population may be excepted from the provisions as to length of courses and hours of instruction per week to meet their particular needs.

The bill provides further for the details of making appropriations for training teachers of trade and industrial subjects and requires that not more than 60 per cent nor less than 20 per cent of any appropriation for training teachers shall be expended by any state in the preparation of agricultural teachers or of teachers of trades or of home economics. Six additional sections of the bill provide for the machinery by which the act is to be administered.

NEW YORK VOCATIONAL CONFERENCE.

Teachers from all parts of the state of New York met at Syracuse, N. Y., on May 9th for a conference on Vocational Education. The conference opened at nine o'clock on that day and closed at five in the afternoon.

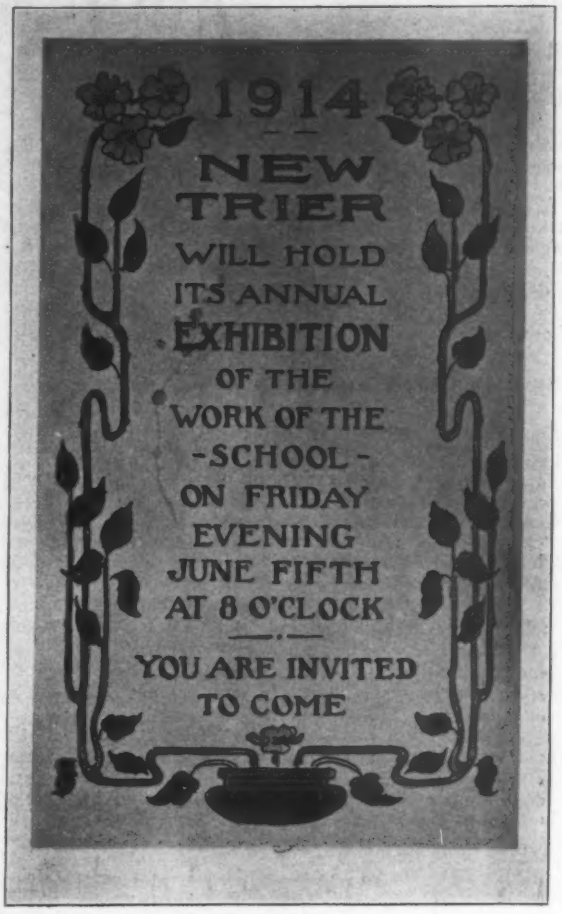
During the morning session illustrated talks were given by Mr. J. H. Smith of the Albany Normal School on "The Value of a Short Unit Course in Evening Vocational Schools" and Mr. H. C. Givens of the Buffalo State Normal on "Shop Methods." The opposition was supported by P. W. Cox of Solvay. Miss Jennie Bettinger of Utica conducted the discussion which followed.

The afternoon session was given over to four speakers including Miss Lena Bray of the Domestic Science Department at Canton, J. W. Shaw of the Syracuse Technical High School and Walter Walker of the Shop Department of the Syracuse high schools.

The following officers were elected: President, C. B. Bradley, Utica; vice-president, Miss E. W. Ryan, Syracuse; secretary, W. J. Kircher, Rome.

WASHINGTON VOCATIONAL COMMISSION.

Professor Herbert G. Lull, of the University of Washington, has been elected president of the Washington State Vocational Commission which was organized on May 11.



A NEAT INVITATION

The above invitation was designed by a student of the New Trier Township High School, Kenilworth, Ill., and was used for the annual exhibition of the manual training and household-arts departments. The outline of the design and lettering was reproduced in zinc and printed. Girls in the class filled in the design with water colors. The original card measured 3½ in. by 5¾ in., buff, eggshell bristol board.

The first meeting of the Commission with the members of the Citizens' Advisory Board was held on June 24. The problem of what the state should do to encourage vocational education was presented in the form of brief reports drawn up by members of the commission. A tentative program for a survey of the state's vocational needs was read and discussed.

It is the purpose of the commission to investigate from every standpoint the possibilities of vocational education and the ways and means of accomplishing the same so far as is possible in the brief time at its disposal before the meeting of the legislature in December. The commission will seek to avoid findings of other commissions in so far as the recommendations of the latter apply to Washington conditions. It is probable that the Commission will recommend a bill which will relate the vocational courses very closely to the existing schools and to the present administrative machinery.

Niagara Falls, N. Y. A special committee of citizens has been appointed by the board of trade to discuss with the school board and the mayor the broadening of the scope of Industrial Education in the city.

Sac City, Ia. Domestic Science has been introduced in the high school.

BOOK REVIEWS

Sheet Metal Drafting.

Louis Caldwell Dewey. 100 plates. Price, $1.25. Dewey Blueprint Co., Manitowoc, Wis.

This is one of Mr. Dewey's drawing series. It consists of 100 blueprints showing in detail the conic sections applied to the tinner's trade. The prints are substantially bound in loose leaf note book covers.

Sheet Metal Drafting has no space at all given up to text matter. The drawings are carefully and accurately made, and the prints are exceptionally clear, hence the book has the merit of presenting the facts of such drafting in graphic form without reading matter for "fillers."

This is a helpful and valuable group of blueprints both for the teacher of mechanical drawing and for those interested in sheet metal work.

Radford's Manual Training, Volumes I and II.

By Ira S. Griffith. 626 pages. Radford Architectural Company, Chicago, Ill. Illustrated. Cloth Bound. $3.00 per set.

These two volumes contain the best of the articles written by Mr. Griffith and published in the "American Carpenter and Builder," under the heading of "Manual Training" and more recently, "The Home Workshop." They are in response to a persistent demand for the material in permanent book form.

For manual training teachers, pupils and instructors, and to the ever growing class of home shop enthusiasts, it furnishes a wealth of material in shape to be used. More than 145 designs of sturdy furniture are given together with working drawings and itemized mill bill of material.

Volume I contains the list of equipment for the home shop, models for home shop construction. Volume II contains the directions for finishing the woodwork, and descriptions of other handicrafts such as stenciling, tooled leather, hammered metal, etc.

Dressmaking in the School.

By J. C. Cooke and H. M. Kidd. 148 pages. Price, $1.35, net. Longmans, Green & Company, New York, Bombay and Calcutta.

This book will be especially serviceable to those teachers of sewing who wish to give their work an industrial significance, and as a preparation for profitable employment. It is based on business requirements and the methods are essentially practical.

Part 1 deals with work suitable for upper classes in the elementary school, with a few trade exercises. Each sewing exercise is preceded by a lesson in the drawing of the problem. Part 2 is especially designed for trade school work. Accuracy and precision are emphasized and the value of time is an important element. As the exercises are intended to prepare girls for the trade, nearly all of the stitching is done on the machine and a few lessons are given in decorative stitchery. The garments planned consist of outer garments rather than undergarments as is the case in most school sewing work.

Kitecraft and Kite Tournaments.

By Charles M. Miller. 144 pages. Price, postpaid, $1.00. The Manual Arts Press, Peoria, Ill.

The author in his position as Assistant Supervisor of Manual Training in Los Angeles, has made a careful study of kite construction and his annual kite tournaments attract more than local attention. The reasons for his intense interest in kites is shown in the following sentences in the closing paragraphs of this book: "It is not just the pretty kite soaring high in the sky, remember there is a boy at the other end of the kite line."

The book is a very complete and interesting treatise on the subject of kites and kite flying. It is profusely illustrated with photographs, drawings and diagrams. Four chapters are devoted to aeroplanes, gliders, propellers, motors, gears and winding devices. Two chapters describe the methods of conducting kite tournaments. A complete bibliography of kites is appended.

The book will be of great service, as well as of much interest to every teacher of elementary manual training.

Design.

Sixty pages. Price, 25 cents. The Prang Co., New York, Chicago, Boston.

Design is presented in this text as related to pictorial as well as constructed forms under the accepted principles of rhythm, balance and harmony.

Excellent and numerous illustrations are used to impress these principles and show their applications to the various forms of execution in school work. The properties of color, hue, value and intensity are defined and referred to color charts. Monochromatic, complementary and analagous color schemes are defined and illustrated.

Dominant Harmony is explained and sources of color schemes in nature are emphasized. The application of design in wood-block printing, stencil cutting, leather, metal and clay are given. The text is a desirable one for upper-grade and high-school students.

Figure and Animal Drawing.

Thirty-eight pages. Price, 25 cents. The Prang Co., New York, Chicago, Boston.

Proportions of the normal human figure for different ages are given with instruction in the method of developing simple drawings of the human figure in various actions.

The anatomy of the cat, dog, horse and cow are illustrated and action in these animals discussed. The book will aid high-school students in this difficult kind of drawing.

Practical Homemaking.

Mabel Hyde Kittredge. 153 pages. The Century Co., New York.

This book is intended for the first year of domestic science work. It deals in a very plain and practical way with the pressing problems which confront the homemaker.

A few of the chapter headings will give an idea of the scope and practical nature of the book: Household Hygiene and Furnishing; Plumbing Lesson; Cleaning the Kitchen; Care of the Stove; and Food Value.

In the Appendix is found an interesting and valuable lot of information. One very helpful thing is an itemized list with prices of all that is needed for the "Suitable Furnishing for a Model Housekeeping Flat or Home for Five People."

The Craft of Hand-Made Rugs.

By Amy Mali Hicks. 250 pages. McBride, Nast & Company, New York.

Old time crafts have more than historical charm for the modern craftsman. Even if the design fails to apply to modern conditions, there remains the method of making a useful article from what would otherwise be waste material and adapting the design to present needs. Such is the case with the craft of rug-making by hand.

This little book describes many interesting methods of weaving, braiding, knitting and crocheting by which our colonial householders made themselves comfortable from materials such as we discard.

A chapter on dyes advises the use of the natural dyes our grandmothers used as preferable to the cruder colors produced by the chemist in modern coloring matters and describes the methods of preparing and using these dyes. The Braided Rug; Knitted Rug; Crocheted Rug; Hooked Rug; Needle Woven Rug and Colonial Rag Rug are described and illustrated in this interesting book.

Other chapters are devoted to methods of Stencil Making, the Tufted Counterpane; Old-time Candles and the Batik or Wax Resist Process.

GENERAL NEWS NOTES

BLOOMINGTON, ILL. A course in domestic art will be offered in the high school next year.

EVELETH, MINN. A contract has been let for the erection of a manual training building to be located near the high school. It will be used exclusively as a manual training and trade school.

DUBUQUE, IA. Vocational schools will be opened in the near future.

A RECENT product of the initiative which is strongly encouraged in the students of the Quincy School, Boston, Mass., is the school publication, the Scholars' Weekly.

In the preparation and final printing the pupils do all the work with no corrections from the teachers, the idea being that mistakes look much larger in the paper than they do in the manuscript and will therefore look the more uncompromising to the youthful editors. This plan has worked out quite satisfactorily as the pupils see in the completed paper what they never saw in the copy which they had previously prepared.

JOLIET, ILL. As a practical test of the value of a year's work in Manual Training, the students, under the direction of the instructor, have begun the construction of a two-story frame building to house the domestic science and manual training classes. The building will cost $1,000 including all the material, and will be completed in six weeks' time.

HUNTINGTON, IND. Students of the cement work class, in the Manual Training Department of the high school, have constructed a concrete sidewalk on the school grounds. The work was done by the students under the direction of the head of the department.

HAMILTON, O. Plans have been made for the establishment of a part-time industrial department in the public schools. The school is designed to take care of the educational needs of the local factories. A capable director will be placed in charge.

EAU CLAIRE, WIS. The continuation course at the high school has been enlarged and steps have been taken to provide a separate model apartment for the teaching of housekeeping including dressmaking and millinery.

THE NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION announces the removal of its offices to 140 West 42d Street, Rooms 92-95.

HIGHLAND PARK, MICH. Supt. T. J. Knapp has begun preparations for the inauguration of a course in Agriculture for the pupils of the three upper grades. Lectures will be given on home gardening. Model school gardens are planned with special instruction on the preparation of the soil, planting and cultivating. Regular credits will be given for the work done by the pupils.

OLEAN, N. Y. An industrial course offering a two-year training in general industrial subjects to boys of 14 years who have graduated from the sixth grade has been provided. The students spend half their time in the shop and the remainder in the classroom studying practical subjects that are directly related to their work in the shop.

LEWISTON, IDA. A course in Agriculture, Horticulture and Gardening has been introduced in the schools for the next school year. Mr. John J. Hayden, of the University of Idaho, has been appointed to have charge of the science and agricultural work for the schools.

NEWPORT, R. I. Beginning with September, the entering class at the Rogers High School will be offered a course in Household Arts which will be extended later to the sophomore class.

FALLS CITY, ORE. Numerous articles made in the schools including office desks, cabinets and chairs have been sold to the business men of the town with a substantial profit for the schools.

FOUR-YEAR training courses for the Worcester Trade School for Girls have been recommended by the Supervisor, Miss Helen Hildreth to provide adequate training in the line of dressmaking. Miss Hildreth finds that there is a demand for seamstresses who can go to homes and sew and for which the present two-year course does not fully equip the girls. It is her opinion that girls of special ability in this line would profit materially from the instruction.

ONE of the interesting events of commencement week at the high school at Ellsworth, Kans., was the reception given by the members of the Manual Training and Domestic Science Departments at the school gymnasium. The affair was public and included exhibits of the work done in the two departments. The class in domestic cooking prepared and served refreshments for the guests.

STUDENTS in the Portland School of Trades, Portland, Ore., have offered their services in the construction of the furniture for the governor's apartments and the reception hall in the Oregon Building at the Panama-Pacific Exposition to be opened next year. The furniture is to be made of oak lumber and will be of artistic design. At the close of the exposition, the furniture will be returned to the city as the property of the school district.

LEOMINSTER, MASS. A school of Domestic Arts has been opened on the lower floor of a dwelling house. The school has six rooms equipped for housekeeping.

FOND DU LAC, WIS. At a cost of 20 cents per plate the girls of the Fond du Lac Vocational School served an appetizing and satisfying dinner to 36 officials on the evening of May 12. Hardly less remarkable is the fact that the regular work of the school was carried on without any interference from the dinner plans, the work being done in the cooking classes during the regular class periods. One of the students acted as head dining-room girl, and the various courses were served with dispatch by other members of the cooking class.

COUNCIL BLUFFS, IA. A vocational survey has been begun by Principal J. E. Marshall of the local high school to learn thru individual inquiry what the intentions of the high-school students are in regard to occupations they will follow on leaving school. The information collected thru the survey is to be used in preparing pupils for the particular occupations which they have in mind.

THE ANNUAL EXHIBIT of the Mechanical and Commercial Departments of the Cass Technical High School, Detroit, Mich., was held on June 4th and 5th in the work shops and laboratories of the school.

Classes were shown at work and exhibits were made of woodworking, wood-turning, patternmaking, mechanical drawing, applied design, machineshop work, printing and commercial work. A feature of the exhibit was an arrangement of the work in order as it is given in the regular courses. There were also special exhibits showing the processes of manufacture of different articles in all stages, from the raw material to the finished product. The school has an enrollment of 850 students.

COUNTY SUPERINTENDENT EDWARD J. TOBIN of Chicago has announced the preparation of plans for a continuation course in printing in Cook county rural schools. Thru the initiative of Mr. C. L. Woodfield, director of the Chicago Typothetae School, a proposition has been presented from eighteen of the large printing establishments offering boys from the county schools who have passed the grammar grades opportunities for a two-year course in any of these print shops. It is provided in the new plan that the boys shall work four hours a day, being paid for their time from the start. The course is to be completed in two years.

ACCORDING to a report of State Supt. Frank W. Miller, Manual Training and Domestic Science are becoming popular courses of study in the schools of Ohio. During the past year there were 27,000 pupils receiving instruction in Manual Training and 25,000 in Domestic Science.

The report shows that most of the Manual Training teaching is in the cities. Forty-five cities are teaching it while 35 do not include it in the course of study. Five townships have introduced the subject.

Domestic Science is taught in 91 schools. Thirty-seven cities are teaching it and 43 are not. Twenty townships have introduced the subject.

MONTEVIDEO, MINN. A new high-school building is in process of construction in which will be housed the three departments of Manual Training, Domestic Science and Agriculture. The building will cost $125,000. The school will have provisions for shop work to which the pupils of the three higher grades and also the first two years of high school will be eligible. Mechanical drawing has been provided for the third year and Forging for the fourth year of the high school.

NOW, ARE THERE ANY QUESTIONS?

Readers are urged to ask questions concerning the Industrial Arts. The editors will reply to those questions which they feel that they can answer, and to other questions, they will obtain replies from persons who can answer them authoritatively. Questions should be addressed to THE EDITORS.

Printing Equipment.

Johnstown, Pa. Q:—Is it practicable for a school to print its own small paper with a moderate priced school equipment?

A:—It is entirely practicable. This is being done in scores of places.

Denver, Col. Q:—Do you advise printing for a Boys' School? Could the boys do the school printing?

A:—By all means put printing into your school. The boys can do the school printing and will be delighted and greatly profited by doing it.

Gold Plating.

Pontiac, Ill. Q:—What is the purpose of the gas plate suggested in the list of items for gold plating by Mr. Sorensen?

A:—This is for the purpose of heating the plating solution which is necessary before the plating is attempted.

Forging Courses.

Corvallis, Ore. Q:—Can you give me the names of some schools or colleges that are teaching Industrial Arts? We are arranging to put a three-year vocational course of Blacksmithing in our college so that young men wanting to take that course as a vocation will be able to start in business for themselves. I understand the instruction in the work but I don't just see my way clear in writing up my course and dividing it up into a three years' course. If you can give me the address of some instructor that is giving a three years' course I would be very thankful.

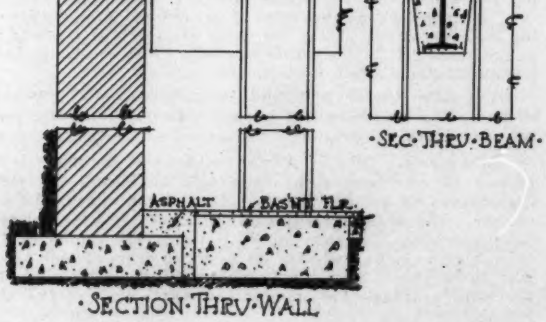
A:—We do not believe that it is possible to lay out a fixed three-year course for forge work, for the reason that in a class there are always some who advance much faster than others. Probably the best plan is to give in the first year, exercises that involve the principles of Blacksmithing, such as models that require welding in their making. The instructor should demonstrate before his class the making of each piece and for the fast boys who will be sure to get thru in advance of the others, he must be prepared to give extra work. For your particular school it would be well to give in the second and third year some work such as is needed on the farm. You might write the Arthur Hill Trades School at Saginaw, Mich., and the Booker T. Washington School, Tuskegee, Macon County, Ala.—*T. F. G.*

Isolating Floors.

E. H. K., Danville, N. Y. Q:—How can the floors of manual training buildings be arranged so that the vibration of heavy machinery will not be communicated to the classroom above and adjoining?

A:—The most successful plan for isolating floors of manual training shops is that introduced by Architects Charlton & Kuenzli of Marquette, Mich., and Milwaukee, Wis., in the high school at Ironwood, Mich.

The floor is carried on a system of steel girders imbedded in the cement of the floor and supported by steel uprights set close to the walls, but resting upon independent footings. An expansion joint is introduced between the wall and the floor and around the footings of the steel supports. The plan and section will give an idea of the construction.



Books on Color.

W. W. T., Minneapolis. Q:—Give me the name of some textbook on the use and theory of color as suggested in Miss Roe's article on page 166 of the May issue.

A:—*A Color Notation.* By A. H. Munsell. Published by Geo. H. Ellis Co., Boston, Mass.

Color Balance. By the same author and publisher.

The latter is only a pamphlet and sells for about twenty-five cents.

Another book which is good on general principles, but not scientific, is called "Color Value," by C. R. Clifford, Published by Clifford & Lawton, 19 Union Square, New York, N. Y. This book uses the old theory of color with red, yellow and blue as primaries.

Book On Blacksmithing.

Normal, Ala. Q:—Can you inform me as to where I can get a textbook on "blacksmithing?" I would like to have one immediately if I can find one.—*L. A. W.*

A:—Hand-Forging and Hand-Wrought Ornamental Work by Thos. F. Googerty. Published by the Popular Mechanics Book Department, Chicago, Ill.

THE school board of Stockton, Cal., has engaged the services of an expert in the person of Mr. George Henry Jensen as Supervisor of Industrial Art in the public schools. Mr. Jensen is a graduate of the technical department of Valparaiso University and has also completed special courses at the Chicago University and Bradley Polytechnic Institute. He has had a varied experience having been connected with a number of high schools and normal schools in the Middle West and South.

THE board of education of Pittsburgh, Pa., has completed plans which provide for the opening of a Domestic Science course for housemaids during the present month.

The school has been placed in charge of Miss Irene McDermott, Director of Household Economy in the public schools. In addition to household work, the students will be taught sanitation by a graduate nurse. It is the purpose of the supporters of the school that the idea be made attractive to store workers in order that a large supply of competent workers may be obtained and a reasonably fair standard of wages fixed.

SANTA BARBARA, CAL. The students of the Manual Training Department, during the summer, will construct bungalow schoolrooms near the Blake Memorial School using the material of a cottage and of two school buildings which have been demolished. The completion of these schoolrooms will mark the first step toward the adoption of the modern idea of open-air schoolrooms for the lower grades.

BOSTON, MASS. Beginning October, 1914, classes in machine operating, millinery, dressmaking, tailoring, cutting and fitting, trade design and cooking will be begun in the Evening Trade School. The Prevocational center in the North Bennet Street Industrial School will be continued in its present location until the completion of the new school in the Eliot-Hancock District.

THE Minneapolis Advisory Commission on Vocational Education has intimated that it will shortly request the board of education to open a Bureau of Vocational Guidance. The proposed bureau will seek to assist foreigners and other adults, as well as school children, who have failed to finish their education or have not been able to select a vocation adapted to their abilities or peculiarities.

The commission favors the appointment of a counsellor for each school, a system of consultation with employers in cases where pupils must leave school early to enter an occupation, and the keeping of records of each individual's work.

"THE SEARCHLIGHT" is the title of a weekly paper issued by the students of the Junior High School, Grand Rapids, Mich.